Property rights in the sustainable management of non-timber forest products

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Abstract

Non-timber forest products (NTFPs) is a term used to describe over 200 species of forest resources, other than timber, harvested for commercial, personal or traditional purposes in British Columbia. NTFPs are characterized as common pool resources and as such are inherently difficult to manage from a typical state-based regulatory approach. This project sought to examine the literature regarding the management of common pool resources and the role property rights play in the stewardship of forest resources. Combined with a legal review of the foundations and existing structure of property rights and resource management institutions in British Columbia, this paper concludes that given the complex ecological, social and economic characteristics which define NTFPs, that a single management approach will not provide an effective, efficient and equitable management regime for NTFPs. Management institutions or models range from state-based to common property to individual and private–based. After examining the various management models, each with its advantages and disadvantages, the paper concludes that in principle, government agencies should maintain its prescriptive role, but minimize any operational role. The report recommends that a mix of management systems be used, drawing from the strengths or each in appropriate circumstances. Given that there are no active models specifically for NTFPs in British Columbia, it is recommended that a pilot project be initiated to test and monitor the various approaches. The paper provides the institutional context to move the discussion of managing NTFPs to the development stage.

Keywords

Non-timber forest products, forest resources, property rights, sustainable resource management, natural resource management.

Preface

Like many other residents of rural British Columbia, John and Jill Smithers no longer have jobs in the forest industry. Once their EI was exhausted, they faced a painful decision: should they move to the city and hope to find jobs there? Or should they tough it out in their home community of Ragged Bay and try to find – or create – work in the place they had lived all their lives?

At a community conference on economic diversification, John and Jill heard about picking and selling non-timber forest products – salal and other floral greens, mushrooms and other wild plants. John was sceptical; picking salal was a far cry from falling timber, but Jill urged him to try it. When mushroom season rolled around, they tried that too. Quite a few other people in the community became NTFP harvesters as well. They faced a lot of problems at first. There were no local buyers. No one seemed to know much about how the product should be picked and handled. It was difficult to convince the local bank or credit union to finance a delivery vehicle or a buying station and no one locally had any capital to invest.

Finally, a small group of harvesters bought an old van cheaply and started running salal and wild mushrooms 200 kilometres down the highway to the nearest buying station. As more local people saw their friends making some money from NTFPs, they wanted to get involved.

It was more difficult now. Harvesters jealously guarded the whereabouts of "good" patches, especially for wild mushrooms and some salal areas close to town were starting to get over-harvested. Local forest companies, required by law to deactivate logging roads, were cutting off access to both established and new picking areas. They were also complaining about garbage left by harvesters and the threat of fire or damage to newly planted trees. The Ragged Bay First Nation was starting to get very concerned about their traditional berry patches and locations of medicinal plants and felt that they, too, should participate in this new industry.

John and Jill, like other harvesters, knew that if they left small mushroom "buttons" to grow for a few days, returns would be much better. They tried that a few times, only to find that other pickers had come through and stripped the patch clean. Jill had learned by doing some research on the internet, that it was possible to fertilize forest lands and improve the growth of both trees and NTFPs, but it wasn't worth it for the improvement in timber alone. In fact, any attempt to manage NTFPs was hopeless, because somebody else would just come in and reap the benefits. It was like putting money on the sidewalk for people to pick up.

John and Jill tried for the next few years to find some way of obtaining a permit or lease for NTFPs. No such thing existed. Finally, as competition grew, they had to travel farther each year and grew tired of working in the wet and the cold. In time, they gave up and moved down the highway to Ocean City. From his job flipping burgers at a roadside café, John watches each day for the truckloads of salal leaving Ragged Bay.

Executive Summary

Purpose of report

The purpose of this report is to examine the use of property rights as a means to develop an effective, efficient and equitable management regime for non-timber forest products (NTFPs).

Background

The term NTFPs refers to resources in the forest other than timber, and which are harvested for commercial, personal and traditional purposes. Over 200 species of NTFPs are harvested from both public and private lands in British Columbia. While no formal management system exists for NTFPs, this in no way indicates that it is a new industry or that there have been no efforts to manage the commercial harvest.

Public land" and "Crown land" are terms used to refer to land vested in the Crown; that is, land which the Crown has not sold or granted or land the Crown has repurchased. However, First Nations have unextinguished and as yet undefined aboriginal rights and title with respect to public land in the province. First Nations' claims give rise to a number of outstanding issues regarding ownership of land and the need to reconcile aboriginal rights and title and Crown ownership. The term "public land" therefore will be used throughout this paper except where "Crown land" is used in a direct quotation.

The main commercial species groupings are edible wild mushrooms, such as the North American Matsutake (*Tricholoma magnivelare*) and Pacific golden chanterelles (*Cantharellus formosus*), and floral greens, such as salal (*Gaultheria shallon*) and deer fern (*Blechnum spicant*). Estimates of the annual value of these and other NTFPs to the British Columbia economy are in the $280 million range.

NTFPs can be characterized as common pool resources (CPRs) where restricting access is difficult and the supply is subtractable. NTFPs are also characterized by their ecological, economic and social heterogeneity. As such, NTFPs are inherently difficult to manage from a typical state regulatory approach. Each of these elements suggests that one single approach to managing NTFPs would not be effective. If undertaken thoughtfully following adaptive management principles the benefits of managing the resource, leading to greater investment in and stewardship of the resource, should outweigh any costs. It is within this backdrop that the paper attempts to provide some insight into possible management responses.

Any management system would attempt to overcome the following issues:

- difficulty in guaranteeing exclusive access;
- high discount rates among commercial user groups;
- high mobility of commercial users;
- high transaction costs associated with NTFP industry collaboration;

- a lack of investment in the resource stock;
- NTFP industry resistance to the introduction of a management regime;
- acceptance that the benefits of management will exceed the costs.

After examining various management models, each with its advantages and disadvantages, the paper concludes that in principle, the State should maintain its prescriptive role, but minimize any operational role.

Our current system of managing the land base allows for an overlapping and interdependent system of rights and responsibilities. This will provide a foundation upon which a variety of approaches can be tested for several products under various conditions. Monitoring and evaluating the most effective, efficient and equitable systems will be an ongoing effort.

The most efficacious approach will most likely combine elements of the three management approaches: state, common property, and private.

Finally, providing rights to resources, be they on private or public lands, requires some form of rent in return. Given that revenues are collected in the Pacific Northwest and on private forest land in British Columbia, it cannot be argued that collecting rents from the NTFP industry for the use of public lands in British Columbia would lead to a loss of industry activity.

NTFP Pilot Project

The complexity of NTFP systems (ecological, economic and social) and the limited information base available to policy makers provides a strong argument for an adaptive management "experimental" approach to management reform. The following strategy is proposed with a 2-3 year time horizon, with ongoing monitoring and evaluation during the implementation phase.

The pilot will incorporate existing legislation regarding NTFPs with the management approaches identified in this paper. The pilot has two components with overlapping but differing scopes:

1. A buyer licensing and reporting system; and

2. The development and testing of management options.

NTFP Pilot Project: Buyer Licensing and Reporting System

As discussed in Section 3, the *Forest Practices Code of British Columbia Act* provides the basis for developing regulations to licence buyers of NTFPs (botanical forest products as they are referred to in the *Code*), and to allow the inspection of vehicles transporting "botanical forest products" and to produce records related to licensed activity.

Fundamental to the success of management options under the pilot project is to be able to identify NTFPs harvested and shipped from the pilot area. As such, within the broader economic region of the NTFP species targeted for management, government will need to establish a buyer's licensing system. The licensing system could include the purchase of a buyer's licence and a requirement to report products harvested by species, volume, value and geographic area (forest district level). Fees collected under this licensing system would ideally fund the development and monitoring of the NTFP pilot project.

NTFP Pilot Project: Development and testing of management options

A pilot project would offer the opportunity to introduce, monitor, and evaluate alternative property rights regimes in a setting where NTFP activity already occurs. This ideal area would be one where research and community development work has taken place and harvesting is established, but where there is little industry infrastructure and considerable flexibility in how the industry may develop. The property rights tools would be designed to fit within existing institutional structures (i.e., within TFLs or TSAs). Under each management option, reporting of volumes and values would be mandatory.

On TSA lands, government would initially provide tenures or licence agreements to a variety of parties interested in harvesting NTFPs. Examples of options to allocate harvesting rights to NTFPs include:

- temporary pilot plots based on area or volume;
- auction of areas with high NTFP values based on area or volume; and
- licensing of NTFP companies with no designation of harvest area or volumes.

The property rights conferred would be based on a combination of state, common property and individual rights as discussed in Section 5.4. For example, within TSA lands a shared-area licence system could be established that would provide the rights to specified NTFPs to more than one individual or entity.

On TFL lands, management options would include providing TFL holders with more comprehensive rights to resources within their management areas. By providing the property rights to NTFPs, TFL holders would then determine how best to allocate NTFP harvesting rights, whether that would be through transferring or selling the rights to a third party, or, for example, through the establishment of a separate NTFP business entity.

Post NTFP pilot project

Results from the NTFP pilot could be used to establish a provincial management regime for NTFPs. The pilot will also provide numerous lessons for other jurisdictions struggling with NTFPs or other common pool resources and their management issues.

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1. Introduction

1.1. Purpose of report

The purpose of this paper is to evaluate how property rights could best be defined in an effort to design an effective, efficient, and equitable management regime for NTFPs in British Columbia. By effective we mean that any system is able to achieve its goals of management; by efficient we mean that the benefits of the system exceed the costs; and by equitable we mean that current and traditional users are not inappropriately displaced. The report employs the concepts of property rights and institutional analysis to explore a variety of management approaches and by doing so provides the institutional context to move the discussion of managing NTFPs to the development stage.

A non-timber forest product is a classic example of a common pool resource (CPR). The owner of the resource is virtually unable to restrict access to the land base on which the resource is found, at least at a reasonable cost, and the resource is subtractable, i.e., one person's use of the resource reduces the remaining harvestable amount of the resource. Being a common pool resource, non-timber forest products are inherently difficult to manage from a conventional state regulatory or private property perspective. This is a well-established industry and any management regime must have cooperation from the NTFP industry and other users of the forest, and any regime must provide benefits to those users if it is to be successful.

In British Columbia, the timber industry is the dominant user of forest resources, although there are large areas of the land base set aside as protected areas and parks that are not open to resource use, except for low impact tourism. A long established system of tenure rights to timber and attendant road networks provide numerous access benefits to other users of the forest. The perception of the public is that public lands are for public use, and government or any private entity has no right to limit that access. As the report discusses, this belief may not be as accurate as some think. First Nations also have unextinguished as yet undefined aboriginal rights and title with respect to public land in the province.

It is the goal of this report to provide a template to establish a management regime for the commercial harvest of NTFPs. The paper provides the legal and theoretical background to inform the development of the appropriate institutions that must underlie any management system and property rights regime. However, further work still remains before implementing any of the management ideas. Consequently, the paper also presents an implementation process as an example of how stewardship of the resource can evolve, combining efforts of government agencies, First Nations, the NTFP industry, the timber industry and other stakeholders.

The report is written for policy makers and any others who are interested in understanding some of the issues, challenges and potential responses to the NTFP management dilemma.

1.2. *Report organization*

Section 2 provides some definitions of terminology and presents a summary of NTFP characteristics, from both a market based and First Nations' perspective. This information will provide the context for discussion in the sections that follow. Section 3 provides a discussion of the legal structure of property rights within British Columbia and the legislative basis for establishing a management regime. Section 4 presents a discussion of the economic context of non-timber forest products, property rights and the institutional approaches to organizing common pool resources, such as NTFPs. Section 5 provides a synthesis of the information and proposes a framework for developing a management regime. While it may appear somewhat redundant to those who read the entire document, Section 5 was written with the understanding that not everyone will. The appendix contains the NTFP characteristic matrix that was the foundation of the discussion of NTFP characteristics in Section 2. A reference section completes the document.

2. Defining non-timber forest products

2.1. *Introduction to non-timber forest products*

"Non-timber forest products" is a term used to describe a wide variety of products and services. De Gues (1995) identified 211 NTFPs harvested in British Columbia for commercial or personal reasons. The report groups them into five general categories:

- wild edible mushrooms,
- floral and greenery products,
- medicinal and pharmaceutical products,
- wild berries and fruit,
- herb and vegetable products,
- landscaping products,
- craft products, and
- miscellaneous botanical products (honey and smoke woods for example).

2.2. *The use and management of NTFPs.*

British Columbia has a large and in many areas a relatively sparsely populated land base. The province's total area is 95 million hectares (234.6 million acres), 94% of which is public land.

The Ministry of Forests is the provincial agency with the management responsibility for 81.9 million hectares (202.2 million acres) of land. Federal land holdings are minor, accounting for only about 1% of the land base and private land accounts for the remaining 5%. Vancouver Island, however, is quite different than the rest of the province with approximately 18% of the land base held privately. The presence of essentially one landowner with the responsibility for stewardship of the forest somewhat simplifies any potential management regime for NTFPs.

Public land" and "Crown land" are terms used to refer to land vested in the Crown; that is, land which the Crown has not sold or granted or land the Crown has repurchased. However, First Nations have unextinguished and as yet undefined aboriginal rights and title with respect to public land in the province. First Nations' claims give rise to a number of outstanding issues regarding ownership of land and the need to reconcile aboriginal rights and title and Crown ownership. The term "public land" therefore will be used throughout this paper except where "Crown land" is used in a direct quotation.

Use of these products range from commercial purposes, to personal subsistence, and First Nations' traditional or ceremonial purposes.

The use of NTFPs is by no means a new or rare phenomenon (Emery and O'Halek, 2001; and Turner and Cocksedge, 2001). A recent FAO publication states: "Non-wood forest products play an important role in the daily life and well-being of millions of people worldwide" (FAO, 2000, p. 81). Unfortunately, the report also notes that data describing these resources are scarce and subsequently the full value of NTFPs is not well understood or appreciated in resource management.[1]

In North America, prior to having any of today's commercial value, NTFPs were used for centuries by First Nations and were part of an array of products used for sustenance, clothing and ceremony. First Nations' management of resources was accomplished through community traditional rights and responsibilities that reflected accepted norms and values, similar to many other indigenous people's use of forest resources throughout the world.

As Nancy Turner states, "land tenure has always been an important element of land and resource use by First Nations. In the past, sophisticated systems were in place that recognized the control, management and use of traditional territories by individual communities or families. Outsiders were not allowed to enter a community's lands or to use their resources" (Turner, 2001, p. 5).

First Nations used a mixture of open access areas absent of property rights, to complete private property based on ancestral rights. Then as today, resources with the highest value had "the most stringent controls and well defined boundaries" (Turner and Jones, 2000, p. 17). Also similar to today's property regimes were harvest and exclusion rights, traditions of succession, and obligations and responsibilities towards use and care of the land (Turner and Jones, 2000).

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[1] The FAO uses the term non-wood forest products to avoid including various wood products such as shake and shingle, Christmas trees, or other wood based products. In other areas the term special forest products or botanical forest products is used. This document will use the term non-timber forest products, or NTFPs, unless referring to other jurisdictions using other terminology.

First Nations have also passed down through generations the knowledge of how these resources are used, whether for food, traditional or medicinal reasons (Turner and Cocksedge, 2001). Thus, the value of the resource to First Nations' embodies both the resource itself and the knowledge of how to use it. Rights to this intellectual knowledge are currently not formally recognized. Thus for First Nations, the subject of property rights to NTFPs goes beyond what is being discussed in this report to include both the rights of access (the subject of this report) and the intellectual property rights to what products are of use and how to use them.

Attempts at managing NTFPs in present North American industrial society are relatively new and reflect their perceived low value in both relative and absolute terms. For just over a decade, the provincial government in British Columbia has considered managing the commercial harvest of NTFPs. The original focus was directed towards pine mushrooms, or North American Matsutake (*Tricholoma magnivelare)* where increased demand in Japan for pine mushroom imports and diminishing regional supply of Japanese Matsutake (*Tricholoma matsutake)* led to a seemingly insatiable demand for the North American version, and subsequently high prices paid to pickers and buyers. The value and demand of other products such as cascara bark (*Rhamnus purshiana*), western yew (*Taxus brevifolia*), salal and many others have also led to an immense increase in interest and activity in the woods. NTFP companies are always seeking new products and uses for forest products.

In British Columbia in 1989, an inter-ministry committee was convened to investigate the increasing interest in pine mushrooms and to make recommendations to government for the potential management of the resource. The subsequent unpublished document *Options for regulating the wild edible mushroom industry in British Columbia* (B.C. Ministry of Forests, 1989) led to the recommendation of an interim licensing system, in the form of a special use permit, providing pickers with the right to access public lands. None of the recommendations were implemented.

In 1993, the B.C. Ministry of Forests released the draft report *Agroforestry industry in British Columbia: identification of issues, responsibilities and opportunities for the Ministry of Forests* (de Geus, 1993). The report was the first comprehensive look at of the use of NTFPs for commercial purposes. In 1994, the Pine Mushroom Task Force was established to seek input from NTFP industry participants, communities, government and other stakeholders in an effort to identify NTFP issues and concerns.

The Pine Mushroom Task Force concluded that "the current status of an unregulated pine mushroom industry is unacceptable and that action [was] needed for the fall of 1994" (BC Ministry of Forests, 1994, p. i.). A number of issues were identified by the Task Force, which are still relevant today, for not only the pine mushroom harvest, but also the harvest of other NTFPs (in order as they appear in the 1994 report):

1. sustainability of the forest ecosystem;
2. forest resource use and land-use planning;
3. economics of harvesting and revenue to government;
4. administrative burden on industry and government resources;
5. social and economic factors;
6. health and safety;
7. ownership of the mushroom resource;
8. interaction and cooperation among agencies and organizations; and
9. First Nations rights.

The Task Force established a set of goals to guide the development and choice of an appropriate management system. The goals were for pine mushroom harvesting to be managed as an ecologically sustainable industry; such that it would be conducted in a safe, healthy and responsible manner; efficiently and effectively. Additional goals were to resolve resource use conflicts; avoid infringement on First Nations rights or prejudice treaty negotiations; and to maintain and enhance regional economic sustainability.

The Task Force identified ten management approaches:

1) a moratorium on commercial harvesting;
2) a continuation of the status quo;
3) a continuation of the status quo combined with voluntary industry cooperation;
4) license mushroom buyers only;
5) license harvesters only;
6) license exporters only;
7) license both harvesters and buyers;
8) volume-based harvesting quotas;
9) area-based volume quotas; and
10) time-based harvesting rights.

The Task Force's evaluation of the options or approaches was based on the stated goals for a management system. The approach recommended the licensing of pine mushroom buyers as an interim framework. The underlying reasons for this choice was the lack of sufficient information about the industry, administrative ease, and uncertainty related to the potential efficacy of the more in-depth management options.

These earlier efforts culminated in the report, *Botanical forest products in British Columbia: an overview* (Ministry of Forests, Integrated Resources Branch, 1995). The 1995 publication identified 39 NTFP related issues facing industry and government. It recommended the adoption of the Pine Mushroom Task Force's recommendations, and also that research should be conducted to determine the costs and benefits of regulating the buyers of botanical forest products under the *Forest Practices Code of British Columbia Act*, which came into effect in 1995. Since then, there has been little progress within government to manage NTFPs.

Evident is the need to further our understanding of the types of management systems that may improve sustainable forest management practices. A report prepared for the British Columbia Ministry of Forests entitled *Botanical forest products: effects on operational planning* (Westland Resource Group and Genoa Environmental Consulting, 1998) provided a summary of policies and guidelines addressing the use of NTFPs in British Columbia and listed various operational issues. Interspersed throughout the document are comments from NTFP industry participants and other stakeholders, which provide a valuable insight into beliefs and expectations of the industry. A report by Tedder, Mitchell and Farran (2000) *Seeing the forest beneath the trees: the social and economic potential of non-timber forest products and services in the Queen Charlotte Islands/Haida Gwaii* highlights numerous complications associated with managing NTFPs in British Columbia, and more specifically on the Queen Charlotte Islands/Haida Gwaii. These issues include Haida's traditional use of forest resources, community attitudes towards government interference with what is considered a local (free) resource, and the competing and complementary relationships between timber and wild mushroom harvesting. Other challenges noted in the report include the need to acquire annual data on the volumes harvested; however, to do this would require some form of management system including a requirement for annual reporting of volumes harvested or purchased. This would provide both invaluable data to monitor the sustainability of harvesting operations and assist in the understanding of the trade-offs between timber and NTFPs. Clearly, management and information requirements persist and have not been adequately addressed.

Other jurisdictions have a longer history of implementing management regimes for the commercial harvest of NTFPs, in some cases, successfully and in others not so successfully. In the Winema and Deschutes National Forests of Oregon State for example, a permitting system was introduced in 1989 to manage the pine mushroom harvest. The intent of the program was to learn more about the harvest of pine mushrooms and to educate harvesters in, for example, appropriate harvesting techniques and woods safety. Compliance in the first year was very low at about 3-5% of total harvesters, but by 1998 had reached 90% (Pilz et al, 1999). Other products also require harvesting permits or contracts and in some area have done so for decades. In Washington State legislation was introduced in 1989 requiring buyers to report quantities of mushrooms purchased by county. The law had very limited success, however, and was allowed to expire in 1994, although State laws have been rewritten and do require harvesters to obtain picking permits from the landowner and for transportation of the product.

There is a danger in establishing management regimes that are too restrictive. Simply establishing any property rights framework may not achieve the goals set out by the issuing agency. Land managers in the U.S. Pacific Northwest recognize the danger in over-regulating, for example, the mushroom industry: "The dispersed and transient nature of mushroom collection and sales makes registration, licensing, and taxation difficult. Buyers may go elsewhere (wild mushroom harvesting is a global enterprise) to purchase mushrooms if local regulations become too burdensome..." (Hosford et al, 1997, p. 45). Clearly defined goals and a careful analysis of potential management regimes, their institutional basis and property rights options should precede any management efforts.

This paper reflects the view that it is time to revisit not only the management of the pine mushroom harvest but also the harvest of all NTFPs. The industry continues to expand, our knowledge continues to expand, and the issues identified by the Pine Mushroom Committee of 1989 and Pine Mushroom Task Force of 1994 are still relevant and perhaps more serious today. In addition, we now have examples of NTFP management efforts in other jurisdictions that can help to guide us in the development of an appropriate management regime in British Columbia.

2.3. NTFP characteristics

A fundamental requirement to the design of a management regime for any resource is an understanding of various resource characteristics. This section will provide two perspectives of this understanding. The discussion in Section 2.4 is written with a western market based perspective and is intended to provide detail about the **commercial** use of NTFPs in an effort to examine potential management regimes for the **commercial** harvest of NTFPs. Section 2.5 discusses characteristics from a First Nations perspective[2], but not based on the commercial management of the products, but on the traditional knowledge, use and rights to forest resources and how that use meshes with the commercial use and management of NTFPs.

The discussion in Section 2.4 is based on a the characteristic matrix presented in full in Appendix 1. The matrix uses six NTFP product groupings:

- edible wild mushrooms,
- floral and greenery products,
- wild berries, fruit, herb and vegetable products,
- landscaping transplants,
- craft products, and
- medicinal and pharmaceutical products.

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[2] Section 2.5 discussing the NTFP characteristics from a First Nation's perspective was prepared by Tmixw Traditional Studies, the research arm of the Nicola Tribal Association.

The characteristics for each NTFP grouping are based on four categories:[3]

1. biological, physical, and technical characteristics;
2. economic and market characteristics;
3. harvester and community attributes; and
4. institutional structure.

While these groupings reflect various similarities among products, there are also significant differences within groupings and categories. The attempt here is to provide as much information as possible in a condensed format; however, there are likely some, and perhaps numerous, omissions in each category. Some of the discussion may not fully explain the characteristics of each grouping and in some cases the lack of information becomes an important characteristic itself. The description of characteristics reflects the abundance or lack of information available to the decision-maker.

2.4. NTFP characteristics

2.4.1. Biological, physical, and technical characteristics

De Geus (1995) has identified over 200 species of NTFPs that are harvested in British Columbia. This list does not include many other species (including many varieties of wild mushrooms) that are harvested for personal, or traditional use. Managing for perhaps 15-50 target species within a particular ecosystem clearly presents daunting challenges compared with managing for a small number of commercial tree species within the same ecosystem. Management strategies directed to maintenance of biodiversity and that mimic natural processes or disturbance are likely a more appropriate overall strategy than attempts to optimise conditions for particular species. In some cases however, enhancement of very high-value species (such as pine mushrooms) or a subset of species with complementary requirements (e.g. burning for berry production which also enhances production of morel mushrooms) may be appropriate.

As noted above, there are dozens of species of commercial interest. It is a misnomer to speak of the NTFP “industry” as it is in fact many industries, each of which has its own particular structure and markets. Our lack of understanding of industry structures and development requirements (with the partial exception of edible mushrooms and floral greens) is a major limitation on our ability to promote the sustainable development of NTFPs.

Depending on the species and the ecosystem, NTFP harvesting can range from benign to somewhat destructive in its effects. While it appears that even the harvesting of foliage (e.g. salal) can be unsustainable, practices of greater concern including digging up roots or rhizomes or extracting whole plants for landscaping or restoration purposes. Intensive berry picking may limit food sources for wildlife, although it is expected that the effort required to achieve this level of intensity would discourage complete "stripping" of bushes. The exception to this point is where harvesters cut or tear up bushes and remove them to another site to more conveniently remove the berries. Raking of the forest floor for pine mushrooms or truffles, for example, is believed to have negative effects. Very little is known about the effects of harvesting practices on either the target species or ecosystems with a consequent lack of information about sustainable harvesting levels.

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[3] Adapted from Mitchell 1997.

NTFP harvesting is generally a seasonal activity, with only a few species available most of the year. This seasonality creates challenges for a "one species" business, but also provides the option for diversification into a wide range of products and the creation of a "seasonal round".

Preferences of different species for different conditions also means that within any one area, a variety of species may be harvested, each with its own autecological characteristics. In this regard, NTFP harvesting is much like "mixed farming" where different areas of the farm (low, dry, moist, warmer or cooler) are planted to the crops that best suit these areas.

As noted throughout this report, there are significant gaps in our understanding of NTFPs; knowledge tends to be scattered and there has been no effective way of combining scientific, management and local or traditional knowledge in order to achieve a better understanding of that knowledge which is available.

Communities and forest companies have both expressed concerns with actual and potential damage or nuisance caused by harvesters. Problems identified concern threat of fire, damage to young trees, pollution of watercourses, and garbage. These concerns are often directed toward itinerant harvesters.

2.4.2. Economic and market characteristics

People harvest NTFPs in British Columbia for both commercial and non-commercial, or personal, reasons. Little data exists, however, to indicate which use consumes the greatest volume. For some of the most highly valued products, the interest creates an intense demand for access to the land and resources. Some of these highly valued products include edible wild mushrooms such as pine mushrooms, chanterelles, morels, king boletes, and floral and greenery products such as salal and boughs. The following discussion offers harvest and price statistics; however, there is no robust source of data yet available for specific species or narrow product groupings.

While the domestic market for NTFPs is growing, the major markets for most of the commercially harvested NTFPs continue to be in Europe, Japan and the United States (see Schlosser and Blatner 1993; de Geus 1995, Savage 1995; Wills and Lipsey 1999, Weigand 1998 and 2000, Tedder et al 2000). As suppliers of NTFPs, the Pacific Northwest region of the United States and British Columbia operate within the same markets and many of the same companies often operate in each country. Europe is the prime market for edible wild mushrooms such as chanterelles, morels and king boletes, and for floral greenery products such as salal and assorted boughs. Japan is the prime market for pine mushrooms.

British Columbia and the U.S. Pacific Northwest supply product to a competitive international market for NTFPs. Regional suppliers are generally price takers, meaning they are not of sufficient size to control or influence prices. Prices paid to exporters, subsequently to harvesters, are often set in Europe or Japan, depending on the product. Priced can vary substantially not only among the different products and product categories, but also within product categories. For example, all mushrooms are categorized as "edible wild mushrooms" but have very different prices and harvesting intensities. Harvesters receive the highest prices for pine mushrooms, but values can range significantly by grade. Average prices for pine mushrooms paid to harvesters can range from $10.00 per pound to $50.00 per pound (Meyer Resources Inc. 1995; Blatner and Alexander 1998; Alexander et al, forthcoming). In 2001, prices paid to harvesters of pine mushrooms reached $45.00 per pound, but a few days later declined to $20.00 per pound (Tedder et al, 2000).[4] For chanterelles, in 1999, the price paid to pickers went as high as $7.50 per pound on the Queen Charlotte Islands, while averaging about $4.50 to $5.00 per pound.[5] In the 2000 and 2001 seasons, prices paid to pickers of chanterelles declined to $1.50 per pound as a result of supply increases from eastern Europe and Russia. Prices for individual species may also vary by region, and a harvester's information network ensures the movement of labour to where the price differential exists.

In terms of declared export values, prices can also vary substantially. From 1996 to 2000, average annual declared export prices for edible wild mushrooms shipped to Japan ranged from approximately $30.00 to $40.00.[6] Average declared export prices of edible wild mushrooms shipped to Europe ranged from $14.00 to $22.00. Greater fluctuations can be seen during any particular year. Note that while the price paid to pickers of chanterelles declined in 2000, the average declared price of shipments to Europe increased.

Floral greens and Christmas ornamentals in 1997 had an estimated value of US$180 million in the U.S. Pacific Northwest and Southern British Columbia (Laufenburg and Schmieding, 2000). In British Columbia alone the value of florals and Christmas greens is estimated to be in the $55-60 million range (Wills and Lipsey, 1999).

The domestic market structure for NTFPs such as edible wild mushroom and floral greens is quite similar made up of three levels: harvesters, buyer agents, and distributors or exporters. In some cases the harvester acts as the buyer also and some distributors can be located outside the country. The market structure of other NTFPs such as craft products is not well known.

For an industry to have the incentive to invest in the resource and adhere to management prescriptions they must be reasonably assured of the ability to reap the benefits from these efforts. This incentive often has to do with the rights of access provided to a resource user and any limitations. In the case of NTFPs in British Columbia, the Crown "owns" the resources,[7] but little effort has been undertaken to provide legal access to NTFPs. As a result, few companies if any have the incentive to invest in and steward the resource.

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[4] "Mushroom market crashes." The Powell River Peak, 31, Oct. 2001: 7.

[5] Prices on the Queen Charlotte Islands/Haida Gwaii peaked at a higher price than the rest of the province.

[6] Statistics Canada Trade Data, NAICS commodity code 070951.

Harvesters have the incentive to take as much volume as they can for fear that someone else may come along and take any remaining product. As a result, over-harvesting may be occurring for some products resulting in lower values. Distributors also have high discount rates due to product availability and price variability, but they do invest in processing capacity, which indicates a somewhat longer-term perspective for the resource flow. This case is certainly true for wild mushroom harvesting, but may not reflect other products that have less concentrated harvesting interest or where exclusive harvesting areas may be informally established.

Many of the characteristics described above suggest that NTFPs are, or closely reflect common pool resources (CPR). To be considered a CPR, a resource must meet the following conditions:

1. "exclusion is nontrivial due to significant physical or institutional barriers", and
2. the "yield is subtractable." (Ostrom, 1994, as cited in Gardner, et al, 2000, p. 516).

Exclusion is concerned with the ability to limit access to the resource. Being able to effectively limit the number of resource users allows the state, or community to increase the likelihood or ability to steward the resource, by guaranteeing rightful or assigned users with exclusive or communal rights of access. Rights holders will have a greater incentive to increase their level of investment and resource stewardship, knowing they will benefit from the additional work, care and investment. For a CPR, it may be impossible or at least is too costly to limit access and exclude free riders. Consequently, users of public lands have no or little incentive to invest in or steward the resource.

A CPR cannot be enjoyed by everyone all of the time. The product harvested by one user cannot be used by another, thus the yield is subtractable in that as each unit is harvested, the remaining units available to harvest decline. If the yield were not subtractable the resource would be a "public good" which could be enjoyed by anyone at any time. An example of a public good is a scenic view.

Ostrom (1990) expands on these defining characteristics of common pool resources. Common pool resources, as all exploitable natural resources, comprise a stock of resources and a flow of resource units over time. A common pool resource stock, "… is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use" (Ostrom, 1990, p.30). The flow of units, however, "are not subject to joint use … Thus, the resource units are *not jointly used*, but the resource system is *subject to joint use*" (Ostrom 1990, p. 31, *italics added*). A good not subject to joint use is not by definition a CPR, since it now lacks one of the defining characteristics. Thus, the resource flow once harvested and in the hands of the buyer or distributor tends to resemble a private good, which benefits from exclusive ownership. At this point, industry will invest in the resource flow as seen by investment in processing capacity and other distribution infrastructure.

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[7] Note that First Nations have claims to public lands within British Columbia.

Organizational and management implications associated with CPRs include the following (Ostrom, 1990):

- a disincentive to provide or invest in the CPR resource;
- the organization of appropriators for collective action is uncertain and highly complex;
- a lack of information about the resource structure; its social, economic, ecological and institutional context;
- users discount future potential earnings and place a higher value on immediate income opportunities;
- high potential for opportunistic behaviour and free riders.

2.4.3. Harvester and community attributes

Many products we now call NTFPs have been part of everyday life "since time immemorial" (Turner, 2001, p. 2). There are two distinct "cultures" of NTFP harvesters:

1. First Nations who have used a variety of forest products, including products now under the NTFP term, and whose many social norms centred around resources and their use; and
2. the thousands of people who now harvest, among other things, wild mushrooms, floral greens and medicinal products, for commercial and personal reasons.

Who are today's commercial NTFP harvesters? Hansis (1996) identified three types of pickers at Cresent Lake Oregon, which are relevant to many other areas throughout the Pacific Northwest and British Columbia:

- "commuter pickers" who travel to sites for one to three days;
- "vacation pickers" who travel to one picking site where they remain for several weeks; and
- "circuit pickers" who travel to multiple picking sites during the season.

For residents of many local towns there are only two types of pickers: local and non-local. On the Queen Charlotte Islands, some residents see the annual influx of chanterelle pickers as an invasion of undesirables associated with higher crime rates and interference with logging activity. Others see the influx as a commercial opportunity to supply goods and services to the pickers and a benefit to the Islands similar to that from tourists (Tedder et al, 2000).

The ethnicity of the picking population has also become more diverse and has led to various conflicts over rights to access. In the U.S. Pacific Northwest, the late 1980s saw several forces converge to increase the interest in harvesting NTFPs (Hansis, 1998). This increased interest came from local residents searching for supplemental or replacement income, from local residents affected by declines in the traditional logging and timber sectors, and from recent immigrants who found difficulty entering the mainstream economy (Hansis, 1998). Together with longer-term Euro-American and Native American harvesters who were unaccustomed to competition, this increased interest led to "interethnic conflict, [and threatened] the targeted species and the ecosystems of which they are a part (Hansis, 1998, p. 69).

Some researchers see the picker population as more than simply a source of labour and a group to manage and permit. Rebecca McLain and Eric Jones (McLain and Jones 1997, 2001; McLain 2000) consider the "community" of pickers as having an important role in resource stewardship and decision making. For edible wild mushrooms, the highly mobile nature of many of the picking community often leads to these groups being excluded from policy decisions, whether intentional or unintentional, while their depth of knowledge may be invaluable to any management efforts.

In British Columbia, people who harvest NTFPs are also a diverse group. They are made up of thousands of individuals from many walks of life, some who harvest for personal or subsistence reasons, some, such as First Nations as a traditional source of food and medicines and for other ceremonial purposes, and yet others as a source of income or simply pleasure. There are vast differences in the type of knowledge and understanding of the issues at a government, industry or community-level.

2.4.4. Institutional structure

Governing institutions are formal or informal rules, norms and conventions that structure our interactions with not only other humans, but also with the world around us. Government, the NTFP industry including harvesters and buyers, and other users of the forest operate within a particular institutional structure, even though there is no active management of the commercial use of NTFPs. Government does not necessarily have to be the central source of management structure however, and there are many benefits associated with common property, or cooperative forms of management, and private land systems.

In British Columbia, the responsibility for creating rules and managing resources on public land falls to government. Policy and legislation defines who allocates rights to resources and what those rights allow or do not allow. Currently, rights of access to public land for the commercial harvest of NTFPs is not regulated in British Columbia, but this does not mean that an informal, or *de facto,* right to these resources exists. With only limited exceptions at present, the removal of NTFPs for commercial purposes is an unauthorized illegal activity.

User organizations or associations are often created to more formally address issues of resource use and industry activity. For NTFPs this type of industry organization has not been successful. The costs associated with coordinating industry participants and maintaining a more formal industry organization can be fairly high. As a result, the short-term perspective of the industry does not view highly the potential longer-term benefits of cooperation. A wild mushroom association was developed in the early 1990s, but any benefits from this type of organizational cooperation were not clearly visible, or were heavily discounted by its participants, thus it did not succeed.

Any impetus for institutional change, in this case changes in the way NTFPs are managed, must involve one of the actors subject to the particular institutional structure. Yet while one actor may be sufficient to begin the change, all players must share in its success. The current impetus for change in the commercial use of NTFPs comes mainly from the provincial government, which has resource management responsibilities. However, the academic community, First Nations and some NTFP industry participants and the forest industry also support this process. This is not a cohesive group however, and resistance to change does exist.

2.5. NTFP characteristics – submitted by Tmixʷ Research, Nicola Tribal Association.

The following section was provided by Tm*i*xʷ Research of the Nicola Tribal Association, representing 6 Nlaka'pmx Bands.[8] It is presented in a box and highlighted to represent a change in the report's perspective from Euro-Canadian to First Nations. Management of NTFPs has two inseparable sides in British Columbia: one being government's role in the management of the commercial harvest of NTFPs from public lands; and the other being First Nations' desire to co-management resources and public lands within their respective traditional territories. Addressing one without addressing the other would not provide the necessary institutional basis for the stewardship of NTFPs in British Columbia and government-to-government relationships.

> Tm*i*xʷ Research is participating in this report to present one First Nation (FN)'s perspective on NTFP issues. The Nicola Tribal Association (NTA)'s goal is to assert FN rights and title to inform policy and decision makers regarding assumptions of government to the manage NTFPs without meaningful consultation towards co-management and co-jurisdiction. Tm*i*xʷ Research would like to thank the Ministry of Forest, Economics and Trade Branch for the opportunity to incorporate a FN perspective.

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[8] Verna Miller, Jennifer Morrison, and Leona Antoine of Tm*i*xʷ Research, Nicola Tribal Association. Tm*i*xʷ Research provides innovative research to FN communities addressing several issues, such as Indigenous Intellectual Knowledge and Property Rights (IIKPR) issues within land and resource management planning processes.

2.5.1. Traditional Economy

Currently there are traditional principles being exercised by FN society; there has to be more acknowledgement by governments regarding management of products within the market economy

The traditional model of most FN society was based on families units within each community. Life was concentrated around family-owned seasonal fishing sites and gathering areas. The area occupied by the Interior Tribes formed the hub of trading centres, due to the diversity of items that could be traded within the area.

A very important component of traditional economy was the *preparation* of items not only for survival, but for trade. The availability, or non-availability of resources in individual territories created trade because some resources were not available in certain territories. In order to trade finished products, such as tanned hides, carvings, dried berries, baskets, salmon, and beadwork, a great deal of preparation was needed. This preparation time and effort was central to the item value (i.e., note coastal potlatches). Local tribe members also prepared plant extracts for medicinal use by FN society.

FN Shifting Economy

The availability, or non-availability of resources in FN territories created trade because some resources were not available in certain regions. Tribes relied on each other for the sharing and trade of resources, therefore, creating a symbiotic relationship amongst peoples. Trade items included: tools, weapons, clothing, foods and medicines. For foods, the whole or part of the plant was traded, both in dried and fresh form. There was a verbal agreement between communities on the exchanges that took place on the value of commodities, i.e., medicines were of high value because it kept tribes healthy and prosperous. General plant knowledge and uses were exchanged between individuals and communities, while medicinal knowledge was hereditarily valued.

The necessity of trading resources was practiced for generations between Interior and Coastal tribes, with large gatherings taking place every fall in the Fraser Canyon.

Spences Bridge was another principal trading point for all tribes. This association with the fur traders changed the socio-economic characteristics between nieghbouring tribes that formally brought tribes together. The last trading of the year took place in the Similkameen Watershed near Keremeos. Since in the 1800's, FN focal trade centres become relocated by colonial development and infrastructure, which has led to changes in First Nations market economy and infrastructure. Today, there is a renewed strength in the traditional trade economy through events, such as pow wows, potlatches and other gatherings.

Distribution Structure of Resources

Although there is limited access to raw resources, a modified system of traditional harvesting by families still continues, and many FN societies are exploring the market opportunities.

There is more demand for First Nations products as FN communities begin the transition to market certified, and sustainable products on the open market. Currently marketing opportunities are unknown, there are concerns about government limiting the raw resources available, and there is are limited FN community-based resource management systems in place. Another significant concern regarding NTFPs is Indigenous Intellectual Knowledge and Property Rights (IIKPR) and the commercialisation of products by government and third parties within FN territories.

2.5.2. FN Aboriginal Law versus Common Resource Pools

Today there is growing interest in utilizing the cultural plant resources of FNs by many user groups, including industry, recreation, ranching and tourism. FNs acknowledge that there is general disagreement between all resource stakeholders about managing these resources sustainably. Being mindful that forest industry revenues and markets are priority, which assist in creating social services, health, education and employment, clearly not all used needs are being met. The recognition of indigenous rights and title as unique and indefinable in western law, or *sui generis* in nature, imposes challenges to the simplistic assumptions that protection policy and laws developed by external bodies can comprehend and accommodate Aboriginal interests.

When FN aboriginal laws are meshed together with western resource management policies, co-management is a necessity. Therefore, FNs need involvement and cooperation by government in developing co-management regimes that will minimize land and resource conflicts. These combined strengths could accomplish resolving of management issues when separate governance systems are applied to the same resource.

Indigenous Intellectual Knowledge and Property Rights

First Nations are currently in pressing the debate with the government on settling the issue of Indigenous Intellectual Knowledge and Property Rights (IIKPR). IIKPR is the traditional knowledge and use of resources by First Nations. Currently IIKPR are dealt with on the general level of patents and copyright, while First Nations' knowledge is not being protected sufficiently. To deal with this issue at practical levels, there is a lack of self-sufficiency within many traditional communities and unequal power between them and the corporate world. First Nations are not at the table when policies and management objectives are discussed and implemented. First Nations need to be included in these processes at the higher level management planning processes.

IIKPR and the Market Economy

For First Nations, IIKPR is a significant issue that needs to be addressed governments and industry support the commercialisation of native plants or resources. Presently traditional knowledge is in demand because Indigenous people are stewards of the land, so now they are being looked upon for assisting in maintaining global biodiversity. National governments are not balancing the rights of IIKPR with those of consumers and other stakeholders. This knowledge is typically not for sale, yet is at risk of being commercialized and commoditized without the acknowledgement nor informed consent of its authors and those who rely upon such knowledge and ancient and evolving practices, not only for sustenance, but as a matter of cultural identity.

Past extraction practices of commercial resources within the untreatied homelands of BC's First Nations typically ignores the importance of lands to the cultural identity, and with respect to NTFPs in particular. The collective knowledge of species of plant (including trees) and animal life, relationships and ecologies, and the landscape itself remains a significant ingredient in knowing both personal and group identity among First Nations here. Specifically with the Nlaka'pmx Nation, knowledge of mushrooms and huckleberries; the places where it grows and is harvested, and the social and physical processes that harvesting serves, the issue of the protection of this knowledge emerges. To co-manage in harmony FNs with all stakeholders, have to address IIKPR and create policy and legislation that all parties agree with.

Consultation

Currently, the definition of consultation needs clarity, given the recent court decisions of *Taku River Tlingit First Nation* v. *Ringstad*, 2002 B.C.C.A. 59., and *Haida Nation* v. *B.C. and Weyerhaeuser*, 2002 B.C.C.A. 147. While federal and provincial governments and licensees have the duty to consult to achieve certainty in negotiated settlements, it is now clear that government and licensees cannot knowingly proceed with operations without it. Forest industries have a key role within the financial stability of the B.C. economy, but their operational activities have an significant impact on traditional use and access. The 6 Nlaka'pmx Bands of the NTA state that this consultation process must occur on a bi-lateral level with provincial and federal governments.

FN Resource Management

Together First Nations and government have a role in developing sustainable management regimes for NTFPs that meet market demand and FN values. During the development of meaningful consultation through government-to-government level discussion (with industry present), there will be a need to address sustainable management principles for all species, including timber and NTFPs. Research involving western scientific methods can support FN concerns about the land and resources. The following plant resource management alternatives include, but are not limited to; seasonal pruning, limited access, application of fire for ethnobotanical needs, selective harvesting of plants, certification of pickers, reduction in mechanical site preparation, reduction of tree spacing levels, and increased sensitively regarding rare and endangered medicinal plants. Recognizing Indigenous Intellectual Knowledge and Property Rights (IIKPR) is crucial in order to achieve co-management and co-jurisdiction.

2.6. Emerging themes

Several themes associated with NTFPs emerge from the preceding discussion of various NTFP characteristics. These themes provide the context for the remainder of the report and will help to guide the choice of an appropriate institutional approach and management regime. The themes identified are as follows:

1. First Nations have unique concerns regarding non-timber resources that include not only access to and availability of the resources, but also the traditional knowledge of its use.
2. Biological heterogeneity
   Significant diversity of species harvested, annual productivity, temporal and spatial variability, and ecological impacts related to harvest volumes and techniques.
3. Economic heterogeneity
   Significant diversity and variability of product values, market supply and demand, labour force, and harvester and buyer discount rates.
4. Social heterogeneity
   Significant diversity within and among commercial, subsistence, and traditional user groups, and a diversity of interests and shared norms.
5. Institutional homogeneity reflecting lack of sector transparency and formal management regime.
6. Lack of information for most product categories on volumes available and harvested, productivity, value, employment and local impacts.
7. Both competing and complementary relationships between NTFP product and timber harvesting.
8. No property rights allocated by the Crown, except for small areas designated under community forest tenures. Regulatory tools do not exist to easily establish a management regime, or ensure exclusivity for the wide variety of products.
9. The NTFP industry is well established and has developed its own system of values and norms.
10. No resource revenues collected by government. Some revenue collected by some owners of private forest land.
11. Monitoring and enforcement capacity does not currently exist.

3. Property rights and the law

3.1 Property rights and property law

Before discussing the management approaches that could be used to provide stewardship for non-timber forest products, it is important to understand the property rights system and institutional structure under which access to the land base is permitted or provided for private use. It is also important to understand the mechanisms available for legal and institutional change.

Definitions of property rights have been articulated within a number of disciplines. Haley and Luckert (1998) draw on several in arriving at their definition:

> Property can be regarded as a physical asset or service of value to human beings – individually or collectively. A property right is a socially sanctioned and enforceable claim of an individual or group to the benefits (pecuniary or non-pecuniary) flowing from property subject to the conditions society places on the use of an asset or service.

Property has also been defined as:

> …everything which is the subject of ownership, corporeal or incorporeal, tangible or intangible, visible or invisible, real or personal; everything that has an exchangeable value or which goes to make up wealth or estate.[9]

Characteristics or attributes of property rights include:

- comprehensiveness;
- duration;
- transferability;
- right to economic benefits;
- exclusiveness;
- security.[10]

The law related to property, both land and other property, defines who is entitled to exercise property rights in relation to different types of property. Property law defines which of these particular attributes of property rights are associated with ownership of different kinds of property rights.

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[9] *Black's Law Dictionary*. 5th ed.

[10] Scott and Johnson, 1983.

3.1.1. Origins of property law in British Columbia

As discussed below, the Crown is a property owner. An understanding of the law relating to property is a necessary foundation for an exploration of existing and possible regulatory and management regimes related to non-timber forest products.

The law relating to property is comprised of common law, equity and statute law. Common law means judge-made law developed over time in the courts of England and, later, Canada. The laws of England were received into the laws of the province of British Columbia in the mid-nineteenth century. Although much judge-made law has been changed by legislation, a great deal of British common law still applies in British Columbia. Canadian common law or judge-made law also continues to apply.

Historically, there were flaws in the administration of the common law and common law principles sometimes resulted in injustice. For example, in the courts of common law the judges refused to look behind the title to land. If a landowner had left title to his or her land with a neighbour on that person's promise to look after it and give it back when the landowner returned, and the neighbour subsequently refused to return the land to its owner, the common law courts would not force the neighbour to give the land back, because the neighbour had legal title to the land.

To deal with these inequities, a body of law known as equity emerged and a separate court of equity was established in England. In British Columbia, all courts have the capacity to administer the principles of common law and the principles of equity. Therefore, in current times the relevance of the distinction between common law and equity is primarily in terms of which body of law is to be applied to a particular situation. The principles of common law and the principles of equity are not contradictory but supplementary.

One of the greatest innovations of equity was the development of rules to enforce trusts. A trust is created when someone transfers property to another party who agrees to manage the property for the benefit of someone else, the beneficiary. The legal title to the property is in the trustee. But courts of equity would enforce the rights of the beneficiary, who were said to have an equitable interest in the property. In British Columbia today, both legal or common law interests and equitable interests are registrable on the title of land in the land title system.

Law is made by acts of the legislature or statutes as well as by the courts. In Canadian law, the federal Parliament and the provincial legislatures are supreme within their constitutional areas of legislative power, subject to some restrictions. Section 92(13) of the *Constitution Act, 1867* gives the provincial legislatures the power to make laws in relation to "property and civil rights in the province". Because of this legislative authority and its supremacy, the provincial legislature can change any law, including common law, equity, or acts it has passed itself. It does this by enacting statutes in the provincial legislature.

3.1.2 The common law relating to personal property and real property

The common law distinguishes between real property and personal property. Real property is land and, generally whatever is erected or growing on land. Real property includes:

- the surface area of a piece of land,
- the undersurface and the air over the land - to the middle of the earth and to the heavens,
- things that are growing on the land,
- things attached to the land, such as houses and other buildings,
- the rights a person has over land, for example, a right of way, easement or lease.

Personal property, on the other hand, generally is all property that is not real property. Personal property includes both tangible and intangible kinds of property. Money, goods, stocks, bonds, patents, copyright, and contractual rights are all personal property. Although the distinction between real and personal property is simple in theory, in practice it is sometimes hard to apply.

A licence to use land is a form of personal property rather than real property. In contrast to a lease, a licence does not create an interest in land but rather gives the right to use property in a manner which otherwise would be a trespass. A licence may not give the right of exclusive possession.

In general, interests in forest resources in British Columbia are personal property rather than real property interests. Forest tenure holders are licence holders and do not acquire an interest in land. The common types of forest tenure are noted below.

3.1.3 Privately owned property

Under common law, a landowner owns not the land itself but an estate, or interest, in the land.[11] The Crown "owns" the land itself. In its everyday usage, ownership of private land means the right of the owner to have the exclusive possession and use of the land, and to sell it or give it away. British Columbia law divides up land ownership into a bundle of separate ownership rights. This concept is rooted in English feudal law, when the King owned all the land but gave rights over parcels of land — estates — to lords. An estate is not the piece of land itself but a bundle of rights in relation to the piece of land

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[11] Oosterhoff and Rayner, *Anger and Honsberger Real Property*, 2nd Edition, Volume 2, at p. 1258. Oosterhoff and Rayner, *Anger and Honsberger Real Property*, 2nd Edition, Volume 2, at p. 1248. Full, free ownership of land is known as allodial title to land. The Crown holds allodial title to land in British Columbia. The kind of title to land held by private landowners in British Columbia is tenurial title.

The Crown may decide what rights will be included in ownership of land in the original grant from the Crown. However, after the Crown has disposed of land, the Crown cannot step in and do what it wants with the land. The Crown does not have the right to sell land for which someone has a fee simple estate, or the right to go onto the land or to use it as it wishes. The Crown can always take back rights in land by expropriation, but the Crown generally must pay for rights it expropriates or takes back.

The difference between ownership rights reserved to the Crown and ownership rights taken back by the Crown is that a landowner has never had those rights which were reserved by the Crown. They were never part of the bundle of ownership rights which constituted the estate in fee simple granted by the Crown to the original landowner.

Rights reserved to the Crown are set out in various statutes such as the *Land Act*. In British Columbia, for example, a landowner normally cannot drill an oil well on his or her property because in most cases the Crown has reserved that right to itself.

Bundle of rights (real property)

Private landowners hold an estate or interest in land known as a fee simple estate. The fee simple estate includes the following rights:

- the right to exclusive use and occupation of the land;
- the right to dispose of the land by sale, gift or will; and
- the right to divide up the bundle of rights and confer them on other people, for example, by a covenant, an easement or a lease.

Different people may have rights in relation to the same piece of property at the same time. For example, two of the main features of ownership of land in fee simple are the unfettered right to dispose of the land and the right to occupy and use the land. However, the right to occupy the land can be divided from the fee simple estate by lease and by life estate. The landowner gives away the right to occupy the land but retains the right to dispose of it.

In addition, the common law allows some rights to use land to be shared or to be separated from other rights to use land. For example, a landowner can grant to another a restrictive covenant, easement, or *profit à prendre*.

A restrictive covenant is a promise made by a landowner to a neighbouring landowner not to do certain things on his or her land, for example, not to build on a certain part of the land. An easement is a right granted by a landowner to a neighbouring landowner to cross over the landowner's land, something the neighbour would otherwise not be able to do without trespassing. A *profit à prendre* is a right given by a landowner to someone to come onto the landowner's property and take some of what is growing or located there, such as timber or gravel.

An owner of the fee simple does not cease to be the owner by granting a covenant, an easement or a *profit à prendre* over the owner's land. However, by doing so the owner has given away or sold a part of the bundle of ownership rights to another party.
In short, an owner of the fee simple can:

- grant a restrictive covenant on the property to benefit another landowner's property,
- grant an easement over the land to a neighbouring landowner;
- give someone the right to remove timber from the land;
- lease the land to yet another person, and then
- sell the land.

Under the common law, the circumstances under which easements and covenants would be recognized and therefore bind future owners of the land were circumscribed. For example, in the case of restrictive covenants and easements, there had to be two pieces of property, one benefited by the covenant or easement and one burdened with it. In addition, restrictive covenants could only require a landowner to refrain from some activity concerning the land rather than require the landowner to do something.

Covenants and easements that do not meet the legal requirements bind the parties who make the agreement but do not bind subsequent owners of the land. In additon, in British Columbia, easements, covenants, and *profits à prendre* do not bind subsequent owners of the land unless they are registered against title to the land. Once registered, they are said to run with the land.

The common law rules governing covenants and easements have been relaxed by statute in certain circumstances. For example, where certain conditions are met a statutory right of way can be created under section 218 of the *Land Title Act* to give its holder the right to cross a piece of land even if the holder of the right of way does not own property near the property over which the right of way runs. Similarly, under certain circumstances, section 219 of the *Land Title Act* provides expressly for covenants on land for conservation purposes, without the requirement of two pieces of land.

Finally, the law allows two or more parties to own an estate or interest in land together. A person can own the fee simple with another individual, a society or a company and the shares of co-owners need not be of equal size. A person can also co-own an interest in land such as a covenant, easement or lease.

Land Title System

Each province in Canada has its own system of dealing with title to land. Some of these systems are similar to the system used in British Columbia and others are quite different.

In British Columbia, a land title system, governed by the *Land Title Act*, records the owners of different parts of the bundle of rights. The land title system maintains a record, by property, of all the estates in and charges on the title of that piece of property. A purchaser takes title to land subject to the rights and charges recorded on the title and to any rights reserved to the Crown. The land title system also provides a way of ordering the priority among the holders of various interests in a piece of land. The interests are ranked in the order in which they are registered, not necessarily in the order the landowner dealt with them.

The land title system deals primarily with privately owned land in British Columbia. Most public land is not registered within the land title system.

3.1.4 Publicly owned property

Subject to certain limitations, under Canadian law the province owns and has legislative authority over most public land[12] in the province. At confederation the Dominion and the provinces agreed that each province would retain ownership of its public property except for the property listed in a schedule to the *Constitution Act, 1867*, including canals, public harbours, railways and other similar types of properties.

However, much, if not all, public land in British Columbia is also included in the traditional territory of one or more First Nations. Since treaties have not been negotiated for most of British Columbia, First Nations have unextinguished aboriginal rights or title to public land in the province. These rights are discussed below.

Public land therefore is owned and administered by the Crown, generally the provincial Crown, subject to unextinguished aboriginal rights and title.

In addition, the provincial Crown has legislative authority over most public and private property in the province. Section 92(13) of the *Constitution Act, 1867* gives the provincial legislatures the power to make laws in relation to "property and civil rights in the province". Section 92(5) of the *Constitution Act* confers on provincial legislatures the power to make laws in relation to "the management and sale of the public lands belonging to the province and of the timber and wood thereon".

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[12] "Public land" and "Crown land" are terms used to refer to land vested in the Crown; that is, land which the Crown has not sold or granted or land the Crown has repurchased. However, First Nations have unextinguished and as yet undefined aboriginal rights and title with respect to public land in the province. First Nations' claims give rise to a number of outstanding issues regarding ownership of land and the need to reconcile aboriginal rights and title and Crown ownership. The term "public land" therefore will be used throughout this paper except where "Crown land" is used in a direct quotation.

The ownership of public land and legislative power over it permit the provincial Crown to act like a private landowner in dealing with its own property. The Crown can dispose of public land or of interests in public land such as easements, covenants and *profits à prendre*.

3.1.5 The impact of regulation on personal property and real property

The province's legislative powers over property and civil rights and over public lands allow the provincial legislature to make laws about private property, both real and personal, and about the use or sale of provincially owned public property. Many British Columbia statutes, including the *Land Title Act* and the *Property Law Act*, regulate aspects of privately owned real property. Others, such as the *Personal Property Security Act* and the *Motor Vehicle Act*, regulate aspects of privately owned personal property.

The provincial legislature also has the power to make laws in relation to the property, both real and personal, owned by the Crown. The result is the province has the authority to pass legislation governing the disposition, administration and management of Crown land, provincially-owned natural resources and any other property owned by the Crown.

In practice, the current regime governing natural resource management in British Columbia is comprised of a complex array of legislation, regulations and policies. Aspects of this regime applicable to non-timber forest products are discussed below.

3.2 Current system of property rights to terrestrial renewable resources in British Columbia

3.2.1 Who owns and can confer public property rights in British Columbia?

The provincial Crown has a proprietary interest in Crown land and other property owned by the Crown in British Columbia. The Crown also has the constitutional authority to make laws governing property, both public and private.

The Crown is a person subject to the general common law and equity except as it is varied or added to by prerogative rules[13] or by statutes that apply to the Crown. Other than those variations, the Crown has the same capacity under the law as any other person to enter into contracts, to acquire, hold and dispose of real and personal property and to authorize agents to act on its behalf.[14] Therefore, unless there are legislative or constitutional restrictions applicable to a piece of provincial public property, it may be sold, mortgaged, leased, licensed or managed at the pleasure of the province[15] and without the necessity of legislation.

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[13] Prerogatives are powers, privileges or rights vested in an official person or in an official body such as a court or legislature.

[14] *McGee* v. *Smith, Esq., Sheriff of Simcoe* (1859), 9 U.C.C.P. 89, per Oosterhoff and Rayner, *Anger and Honsberger Real Property*, 2nd Edition, Volume 2, at p. 1248.

[15] This, of course, is subject to the resolution of any outstanding claims related to unextinguished aboriginal title.

In the role of a proprietor, the Crown can insist upon the inclusion in leases, licences or other instruments of any terms that a private proprietor could insist upon. These include terms that in other contexts would be outside the province's power to impose by legislation.

A province's ownership of natural resources, such as minerals, timber or non-timber forest products on provincial forest land, gives it much more power over the resources than it possesses over privately-held resources. The development and exploitation of a provincially-owned resource can be controlled by the province, either by the province directly harvesting or extracting and selling the resource or by the province granting permits, leases, or licences that authorize private parties to harvest or extract and sell the resource.

The rate of harvest or extraction, the degree of processing within the province, and the price at which a provincially-owned resource is to be sold can be controlled by the province as owner. In addition, the province can profit from the exploitation of provincially-owned resources in a variety of ways: by revenue from direct sales or by licence fees, rents or royalties. In contrast, the province can profit from the exploitation of privately-owned resources only through taxes which are subject to the limits to provincial legislative power to levy taxes on natural resources.[16]

As the proprietor of Crown land on which non-timber forest products are located, the Crown also owns the timber and non-timber forest resources on that land unless it has disposed of some or all of these resources, such as by granting a licence to harvest particular forest resources.

The harvest of trees or other forest vegetation without proper authority is illegal and may result in theft charges under the *Criminal Code* or trespass charges under the *Forest Act* or both.[17] Where a harvesting authority on Crown land has already been obtained by another party, an extension of that authority may, in some cases, be passed from that person to another.

3.2.2 The use of property rights to manage resources

In addition to Crown's proprietary rights and legislative authority over Crown land in British Columbia, it has the right to manage its lands and resources located on those lands. The current regime governing natural resource management in British Columbia consists of legislation, regulations and policies that in some cases supplement and in other cases amend or replace the common law.

In general, current management of forest land is based on legal mechanisms which allow private parties to acquire access to and rights over public forest lands in British Columbia.

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[16] Peter Hogg, Constitutional Law of Canada, 2d ed., Toronto: Carswell, 1885, pp. 569-573.

[17] Ministry of Forests Policy Manual, Volume 1, Chapter 8.

While these mechanisms are largely aimed at access to timber, many of them are relevant to non-timber forest products.

The current management of forest land also includes legislation and regulations governing forest planning and forest practices, primarily in the Forest Practices Code.[18] A number of Forest Practices Code provisions are relevant to the management of non-timber forest products.

Relevant provisions of the Land Act

The *Land Act*[19] defines "Crown land' as land, whether or not it is covered by water, or an interest in land, vested in the government.

Since the Crown is the owner of Crown land, it has the ability to dispose of Crown land by way of Crown grant or other more limited forms of disposition. The *Land Act* sets out a statutory regime dealing with, among other things,

- the disposition of Crown land in British Columbia,
- issuing Crown grants, and
- exceptions and reservations to Crown grants.

The *Land Act*, as well as a number of other provincial statutes, addresses how Crown land is administered. The *Land Act*[20] provides that the minister, currently the Minister of Sustainable Resource Management, has the administration of all Crown land except land specifically under the administration of another minister, branch or agency of government.

The *Land Act* establishes a Crown land registry[21] to record all lands administered by the government and to record the acquisition and disposition of those lands for the purpose of maintaining an inventory of Crown land. Every provincial ministry must record in the registry all Crown lands under its administration and the acquisition in fee simple and disposition of those lands. However, the requirement to record on the registry does not apply to:

- a public road or highway established under the *Land Act*, the *Highway Act* or the *Local Government Act*;
- a forest service road established under the *Forest Act*;
- an agreement to harvest Crown timber under the *Forest Act*;
- a grazing or hay cutting licence or permit under the *Range Act*;

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[18] The Forest Practices Code has four components: the *Forest Practices Code of British Columbia Act*, the regulations, the standards and the guidebooks.

[19] *Land Act*, R.S.B.C. 1996, c. 245, s. 1.

[20] *Land Act*, R.S.B.C. 1996, c. 245, s. 4.

[21] *Land Act*, R.S.B.C. 1996, c. 245, s. 7.

- lands dedicated, transferred or vested in the government under section 107(1) or 108(2) of the *Land Title Act*.

Under section 11 of the *Land Act*, the minister may dispose of either surveyed or unsurveyed Crown land to anyone entitled under the Act if the minister considers it in the public interest. The disposition may occur in response to an application, by public auction, by public notice of tender, or by public drawing of lots.

The minister may dispose of Crown land by:

- selling Crown land,
- leasing Crown land,
- granting a right of way or easement over Crown land, or
- granting a licence to occupy Crown land.

When the minister disposes of Crown land under section 11 of the *Land Act*, the minister may impose terms, covenants, stipulations and reservations the minister considers advisable. These can include, but are not limited to, the following terms:

- the applicant must personally occupy and reside on the Crown land for a period fixed by the minister;
- the applicant must do work and spend money for permanent improvement of the Crown land within that period the minister requires.

In addition, to the dispositions of Crown land authorized under section 11, the minister may permit, under section 14, an applicant to occupy Crown land for any of the following purposes:

- for a period of no more than 2 years to conduct appraisals, inspections, analyses, inventories, surveys or other investigations of the land or of its natural resources;
- for a period of no more than 2 years for any purpose authorized under the *Land Act*; to construct a road, non-commercial airstrip, bridge or trail over the land.

The *Land Act* places a limitation on the disposition of Crown land suitable for timber production. Crown land that is suitable for the production of timber and pulpwood must not be disposed of under the *Land Act* unless the minister is of the opinion that it is required for agricultural settlement and development or other higher economic use.

Forest land

While the *Land Act* deals with disposition of Crown land generally, it does not govern the administration of all Crown land. One type of Crown land that is "specifically under the administration of another minister, branch or agency of government"[22] is forest land. About 83% of British Columbia has been classified as forest land and designated as part of the provincial forest. A wide variety of non-timber forest products in British Columbia are located on forest land in the provincial forest.

The Ministry of Forests is the lead provincial agency responsible for managing the timber, range and recreation resources of British Columbia's public forest land. The mandate of the Ministry of Forests is set out in the *Ministry of Forests Act*[23] which provides in section 4 that the purposes and functions of the Ministry include, among other things:

- encouraging maximum productivity of forest and range resources;
- managing, protecting and conserving forest and range resources taking into account the immediate and long term economic and social benefits;
- planning the use of forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, through consultation with other public agencies and the private sector.

The *Forest Act* is one of the key provincial statutes governing forest resource use in the province. While it is primarily concerned with establishing a comprehensive system for managing the commercial production of timber from Crown lands over the long term, as noted above it has a number of provisions relevant to management options for non-timber forest products.

The Act, among other things,

- establishes the forest tenure system in British Columbia;
- establishes the chief forester's responsibility to assess the potential of land to support continuous crops of trees or forage, determine the size of the provincial forest land base, classify forest land, and establish the purposes to which it will be assigned;
- sets out the legislative regime for managing and administering forest tenures.

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[22] *Land Act*, R.S.B.C. 1996, c. 245, s. 4.

[23] *Ministry of Forests Act*, R.S.B.C. 1996, c. 300.

Tenure systems are resource allocation systems through which private parties gain rights to use public resources. The use of the word "tenure" is linked to the tenurial system of landholding. In relation to the tenure system in British Columbia, the *Forest Act* sets out the ways in which the provincial government may dispose of timber on public land, by authorizing the Minister of Forests or regional or district managers of the Ministry of Forests to enter into agreements granting rights to harvest timber.

Currently, there are eleven types of tenures or harvesting agreements authorized by the *Forest Act*:

- forest licences;
- timber sale licences;
- timber licences;
- tree farm licences;
- pulpwood agreements;
- woodlot licences;
- community forest agreements;
- free use permits;
- licences to cut;
- road permits; and
- Christmas tree permits.

The *Forest Act* lists a number of requirements for each type of tenure. The specific rights and responsibilities of tenure holders are set out in documents such as the licence agreement, management and working plans or cutting permits.

There are two main types of tenure. Volume based tenure gives licensees the right to harvest a specified volume of timber, normally on an annual basis. Area based tenure gives licensees harvesting rights on a specific area of land.

The most common forms of tenure in British Columbia are area based tree farm licences and volume based forest licences and timber sale licences. These three forms of tenure account for about 94% of the allowable annual cut in British Columbia. They give their holders the right to harvest timber but normally grant no rights to other forest values.

Some forms of forest tenure, such as a tree farm licence, a woodlot licence and a timber licence, provide the exclusive – or almost exclusive – right to harvest timber. Other forms of tenure, such as a forest licence or a timber sale licence provide the right to harvest specific volume on a non-exclusive basis.

Some types of tenure arrangements and harvesting agreements are particularly relevant to examine in considering management options for non-timber forest products.

Community forest agreements

One type of harvesting agreement, a community forest agreement, is a new form of tenure created in 1998.[24] It provides not only an exclusive right to harvest timber in a specific area, but may also grant exclusive rights to harvest, manage and charge fees for botanical forest products and other prescribed products.[25] The *Community Forest Agreement Regulation*[26] further specifies that a community forest agreement may give its holder the rights to harvest, manage and charge fees for any or all flora and fungi of the forest, other than timber.

Tree farm licences

Section 35[27] of the *Forest Act* sets out the requirements governing the content of a tree farm licence (TFL). It provides, among other things, that a holder of a TFL must submit, at least once every 5 years, a management plan that proposes management objectives regarding

- management and utilization of the timber resources in the TFL area,
- protection and conservation of the non-timber values and resources in the TFL area, including visual quality, biological diversity, soils, water, recreation resources, cultural heritage resources, range land and wildlife and fish habitats,
- integration of harvesting activities in the TFL area with use of the area for purposes other than timber production,
- specifies measures to be taken by the holder of the TFL to identify and consult with persons using the TFL areas for purposes other than timber production.

Section 35 also provides that a TFL must reserve to the government the right to enter into a free use permit on the TFL areas with a person other than the holder of the TFL.

The *Timber Definition Regulation*[28] provides that, in this regulation, timber includes all special forest products designated from time to time by regulation under the *Forest Act*. The expanded meaning of "timber" applies to the following provisions of the *Forest Act*:

(a) the definitions "Crown timber" and "timber processing facility" in section 1 of the *Forest Act*;

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[24] Prior to 1998, most community forests in British Columbia were established under tree farm licences, forest licences or woodlots.

[25] *Forest Act*, R.S.B.C., c. 157, s. 43.3(c)(ii).

[26] *Community Forest Agreement Regulation*, B.C. Reg 384/00, s. 7.

[27] In this section, "timber" includes all special forest products designated by regulation.

[28] *Timber Definition Regulation*, B.C. Reg. 401/87.

(b) sections 5, 8, 14, 15, 23, 24, 30, 35, 45, 48, 49, 51, 57, 64, 70, 75, 84, 85, 89, 93, 94(2), (4) and (5), 96 to 99, 103 to 105, 108, 110, 114, 117, 118, 120, 121, 128, 129, 131, 134, 136, 143 and 163(b), (d) and (e) of the *Forest Act.*

This expanded definition of timber applies to timber within a TFL and the content of the TFL.

Free use permits

A free use permit[29] may be entered into with a party who requires Crown timber for the purpose of scientific investigation. As discussed below, this provision in the *Forest Act* is used to authorize the harvesting and collection of bark from western yew.

A free use permit also may be entered into with parties for products that will be used domestically and not for resale. For instance, a free use permit can be used in situations where someone wants to cut a Christmas tree for their personal use and not for resale or where someone requires firewood for personal domestic purposes and not for resale. A free use permit can also be used for school boards that require firewood for school purposes.

One other relevant use of a free use permit is with a person who requires Crown timber for a traditional and cultural activity and will not resell it. The *Free Use Permit Regulation* defines "traditional and cultural activity" for the purposes of section 48(1)(g) of the *Forest Act* as an activity that,

(a) has historically been carried out in British Columbia by members of a group to which the person carrying out the activity belongs,

(b) is carried out for a traditional or cultural purpose of the group, and

(c) is not carried out for profit, for a commercial purpose or for the purpose of constructing a residential building or a structure associated with a residential building.

The *Free Use Permit Regulation* further provides that for the purposes of section 49(2.1) of the *Forest Act*, a district manager or forest officer authorized by the district manager may enter into a free use permit for a volume exceeding 50 m^3, but not exceeding 250 m^3, only if the person applying for the free use permit can demonstrate to the satisfaction of the district manager or forest officer that the timber is to be used for the construction of a longhouse, community hall, or other similar structure.

The Act sets out a number of conditions governing the use of free use permits. These include the following limitations:

- a free use permit must be for a term not exceeding one year;

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[29] *Forest Act*, R.S.B.C. c. 157, ss. 48 and 49.

- a free use permit must specify the area of land on which the timber will be cut and the purposes for cutting the timber;
- with some exceptions, a free use permit is limited to a volume not exceeding 50 m3,
- a free use permit must not require its holder to pay stumpage for the timber cut, or pay rent.

Further, a free use permit may be suspended or cancelled without notice by the forest officer if the holder fails to comply with its terms and conditions, the *Forest Act* or the regulations and must contain terms and conditions, consistent with the *Forest Act* and the *Forest Practices Code of British Columbia Act* and their regulations.

Given the range of activities and types of products currently authorized by the use of free use permits, this may be an area where relatively simple amendments could specifically authorize the harvesting of other non-timber forest products.

Special use permits

The *Forest Act* defines a "special use permit" as a special use permit referred to in section 2 of the *Forest Practices Code of British Columbia Act*. The *Provincial Forest Use Regulation*[30] lists the uses of a provincial forest that may be authorized by a special use permit. These include extractive uses, such as gravel pits for road construction, and other uses, such as educational or research purposes.

The Regulation provides that rights granted under a special use permit are not exclusive and do not prevent the government from using the land or authorizing others to use the land.

It is possible that the prescribed uses authorized by a special use permit could be expanded to include harvesting non-timber forest products.

Special forest products

The *Forest Act* defines "special forest products" as poles, posts, pilings, shakes, shingle bolts, Christmas trees and other similar forest products designated by regulation as special forest products. The *Special Forest Products Regulation* designates several other products as special forest products, in addition to those specified in the Act:

- building logs;
- mining timbers, props and caps;
- cribbing;
- firewood and fuel logs;

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[30] *Provincial Forest Use Regulation*, B.C. Reg. 176/95.

- hop poles;
- orchard props;
- car stakes;
- round stakes, sticks and pickets;
- shake bolts, blocks and blanks; and
- shingle blocks.

The Regulation also provides that, where royalty is not payable on a special forest product, stumpage under the *Forest Act* is payable to the Crown.

As noted below, the *Special Forest Products Regulation* is cited by the Ministry of Forests as authority for the policy to support and promote the orderly harvesting of bark from western yew.

Forest Practices

While the *Forest Act* sets up the regime for managing the commercial production of timber, including the tenure system, the Forest Practices Code governs forest planning and forest and range practices on public land.

The *Forest Practices Code of British Columbia Act*[31] contains the authority to regulate harvesting practices of non-timber forest products. The Act defines "forest resources" as resources and values associated with forests and range including, without limitation, timber, water, wildlife, fisheries, recreation, botanical forest products, forage and biological diversity.

The Act defines "forest practice" as timber harvesting, road construction, road maintenance, road use, road deactivation, silviculture treatments, botanical forest product collecting, grazing, hay cutting, fire use, control and suppression and any other activity that is,

(a) carried out on land that is

  (i) Crown forest land,

  (ii) range land, or

  (iii)private land that is subject to a tree farm licence, community forest agreement or a woodlot licence, and

(b) carried out by

  (i) any person

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[31] *Forest Practices Code of British Columbia Act*, R.S.B.C. 1996, c. 159.

(A) under an agreement under the *Forest Act* or *Range Act*,

(B) for a commercial purpose under this Act or the regulations, or

(C) to rehabilitate forest resources after an activity referred to in clause (A) or (B), or

(ii) the government.

The Act provides in section 2 that private land in a tree farm licence or in a woodlot licence and Crown land that is in a Provincial forest (other than Crown land in a wilderness area), described in an agreement under the *Range Act*, or described in a woodlot licence must be managed and used in a way that is consistent with one or more of the following:

- timber production, utilization and related purposes;
- forage production and grazing by livestock and wildlife and related purposes;
- recreation, scenery and wilderness purposes;
- water, fisheries, wildlife, biological diversity and cultural heritage resource purposes;
- any purpose permitted by or under the regulations.

As noted above, the *Forest Act* defines a "special use permit" as a special use permit referred to in section 2 of the *Forest Practices Code of British Columbia Act*. The latter Act provides that a person must obtain a special use permit, if required to do so by the regulations, if the person uses or occupies Crown land that is in a Provincial forest or in a wilderness area, described in an agreement under the *Range Act*, or described in a woodlot licence.

Range land

Crown range is Crown land included within the boundaries of a range district but does not include Crown land that is subject to a lease issued under the *Land Act*. Rights to use or improve Crown range for grazing or cutting hay must be granted by or on behalf of the government in accordance with the *Range Act*[32] and regulations made under that Act and any rights to Crown range under the *Forest Practices Code of British Columbia Act* and the *Land Act*.

The *Range Act* provides that the district manager appointed under the *Ministry of Forests Act* may enter into agreements granting rights over Crown range in the form of,

- grazing licences,
- grazing permits,

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[32] *Range Act*, R.S.B.C. 1996, c. 396, s. 2.

- temporary grazing permits,
- hay cutting licences,
- hay cutting permits, and
- temporary hay cutting permits.

The district manager has the authority to enforce, administer or manage the terms of a grazing lease.

As is the case for an agreement to harvest timber under the *Forest Act*, a grazing or hay cutting licence or permit under the *Range Act* is not required to be registered on the Crown land registry.

3.2.3 Property rights and non-timber forest products

Although they are not comprehensive or fully implemented, there are existing regulatory and policy provisions for the management of non-timber forest products. They are worthy of exploration to assess whether they offer models that could be implemented effectively in their present form, developed further, expanded upon or adapted to apply more widely to manage these or other non-timber forest products.

Botanical Forest Products

The *Forest Practices Code of British Columbia Act* provides the framework for managing forest practices in connection with harvesting botanical forest products. This, of course, does not provide access or the right to harvest but sets up a regime that could be used to govern practices where harvesting occurs.

The Act defines "botanical forest products" as prescribed plants or fungi that occur naturally on Crown forest land. The Act prohibits anyone from purchasing botanical forest products as part of a commercial enterprise or otherwise engaging in trade concerning botanical forest products with a harvester unless the purchaser holds a valid botanical forest product buyer's licence if the botanical forest product

- was harvested from Crown land in a provincial forest or Crown range, and
- is designated in a regulation for the purposes of this section.[33]

No botanical forest products have been designated in a regulation.

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[33] *Forest Practices Code of British Columbia Act*, c. 159, s. 104.

Section 216 of the Act provides the authority to make regulations for establishing a licensing scheme for botanical forest product buyers including, among other things, a regime for applying for and issuing licences, licence fees, inspections for enforcing licensing, and appeals. No regulations have been adopted under this section.

Section 207 of the Act provides the authority for the chief forester to establish standards under Section 8 of the Act for forest practices for, among other things, botanical forest products. No standards have been issued.

The Act also provides enforcement mechanisms that could be implemented if regulations were adopted implementing this management regime for botanical forest products.

As noted above, a community forest agreement may grant exclusive rights to harvest, manage and charge fees for botanical forest products and other prescribed products.[34] The existing regulations refer to all flora and fungi of the forest, other than timber, but could be amended to refer to other non-timber forest products.

Yew bark harvesting

In recent years pacific yew has received considerable attention as a source for taxol, a drug used in the treatment of some cancers. In an effort to satisfy the demand for yew as a raw material for taxol production, the Ministry of Forests encourages the utilization of both the wood and bark of pacific yew from all areas which have been authorized for timber harvesting.

The Ministry of Forests has issued policy[35] to define the broad framework governing the harvesting and collection of bark from western yew. The policy aims to support and promote the orderly harvesting of bark from western yew to provide a source of the drug taxol.[36]

In general, harvesting of yew bark may take place:

- in areas approved for harvesting under an existing agreement, with the consent of the agreement holder, a copy of which must be sent to the District Manager;
- in areas that will be imminently approved for harvesting under an agreement, with a free use permit issued under section 48(1)(d) of the *Forest Act* by the District Manager;
- in areas reserved from conventional harvesting, with a free use permit issued by the District Manager that will authorize the harvest of yew bark but require a minimum number of stems to be left in a range of age and size classes;

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[34] *Forest Act*, R.S.B.C. c. 157, s. 43.3(c)(ii).

[35] Ministry of Forests Policy Manual, 8.12.

[36] The authority cited for this policy is the *Special Forest Products Regulation* and sections 48 and 49 of the *Forest Act*.

- in young stands, with a free use permit issued by the District Manager that will authorize the harvest of yew bark but require a minimum of stems to be left.

The harvesting of yew needles is administered in the same way. Needles may be harvested from 50% of the western yew trees by diameter class in a clump and no more than 50% of the foliage may be harvested from any one tree.

A letter of authorization or a free use permit must include a map and description of the collection area. The collector is required to have the letter of authorization or the free use permit available for inspection by a Forest Officer or a member of the RCMP.

To address concerns about possible over-exploitation, additional conditions of harvest were developed and set out in a Notice to Harvesters and Collectors of Yew Bark.[37] The Notice indicates that yew harvesting is to be done in a similar manner to salvage of cedar shake or shingle material in a post logging operation or of a poling operation done prior to primary harvesting of timber.

The conditions in the Notice include the following:

- proper authorization must be in place, as noted above;
- to ensure species protection, all stumps must be left 25 cm above ground level and no bark may be removed from the stump;
- a modified load destination notice must accompany all shipments of yew bark;
- a Western Yew Bark Register must be maintained by collectors (buyers or wholesalers) and submitted annually to the Regional Manager to report on

a) the harvesting area;

b) number of trees utilized in each area; and

c) weight of bark harvested.

In addition, informal inspections are to be done to ensure that operations are progressing in an appropriate manner, that fire hazard from slash is minimized, and that measures are being taken to encourage sustainability of western yew.

There is no requirement that harvesters or collectors of yew bark or needles make payment to the Crown for those products. If yew logs are removed, the logs must be scaled and stumpage will be charged.

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[37] Ministry of Forests, Ministry Policy Manual, General Procedures for Policy 8.12 - Yew Bark Harvesting and Collection-Special Forest Products, located on Ministry of Forests Web site at http://www.for.gov.bc.ca/tasb/manuals/policy/resmngmt/rm8-12pr.htm

3.2.4 Overlapping rights to resources in British Columbia

Some property rights are exclusive rights while others are not. In British Columbia, we have many examples of non-exclusive access to natural resources and resource exploitation. Non-exclusive use or access include situations where there is more than one type of activity in the same area and where there is more than one licence holder in the same area.

Many forms of forest tenure on land in the provincial forest do not provide exclusive access to holders, even to timber. Area based timber, while contemplating exclusive access to a tenure holder in a specific area, does not necessarily include the right to harvest forest resources other than timber.

As noted above, there appears to be ample opportunity to grant harvesting agreements for non-timber forest products even in many of the locations where the right to harvest timber has been granted to another party. However, the practical implications of doing so may give rise to a number of obstacles that would have to be addressed.

3.3 First Nations' rights to non-timber forest products

3.3.1 Traditional uses

Many First Nations communities engage in a number of traditional uses of land and resources. These traditional uses need to be understood, considered and accommodated in developing a management regime for non-timber forest products.

The Clayoquot Sound Scientific Panel lists a number of categories of traditional uses by First Nations of land and resources, including:

- food harvesting,
- material harvesting,
- ceremonial or religious uses,
- medicinal uses,
- uses related to traditional history,
- uses in relation to cultural landforms,
- transportation,
- uses associated with supernatural beings,
- habitation,

- recreation,
- cross-cultural interaction,
- traditional land management, and
- education and training.[38]

Some traditional uses involve the gathering of non-timber forest products by First Nations and First Nations will have an interest in being able to maintain those uses.

Some traditional uses, such as those associated with ceremonial uses, would be disturbed if others were to enter into a First Nation's territory to harvest non-timber forest products.

3.3.2. Traditional rights

As mentioned above, the Crown's ownership of public land and resources is subject to unextinguished aboriginal rights and title. Only a small area of the province is subject to treaties. Treaty No. 8 covers a portion of northeastern British Columbia and affirms hunting, fishing and trapping rights to those aboriginal people who are covered by the treaty. The only other treaties in the Province are fourteen made on Vancouver Island, one in the vicinity of Nanaimo, two near Port Hardy and eleven in the area of Victoria and the Saanich Peninsula.[39] In the rest of the province, the extent of the rights of First Nations to public land and resources has not yet been fully determined. Any discussion of the management approaches that could be taken to non-timber forest products must take into account aboriginal rights and title with respect to public land.

The law in Canada in connection to aboriginal rights and title has undergone significant changes in recent years and continues to evolve today. Under section 91(24) of the *Constitution Act, 1867*, the federal Parliament has the exclusive power to make laws in relation to "Indians, and lands reserved for the Indians". The application of provincial legislation to aboriginal rights and title, however, is complex and controversial. Prior to 1982, aboriginal rights were vulnerable to provincial laws although treaty rights were not. Both aboriginal and treaty rights were vulnerable to federal legislation.

Since 1982 and the coming into force of the *Constitution Act, 1982*, however, the power of the federal Parliament to legislate in a way that affects aboriginal peoples has been significantly limited. Section 35 provides constitutional protection to existing aboriginal and treaty rights. Treaty rights specifically include rights that exist by way of land claims agreements or may be so acquired.

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[38] The Scientific Panel for Sustainable Forest Practices in Clayoquot Sound. Report 3: First Nations' Perspectives Relating to Forest Practices Standards in Clayoquot Sound, March 1995, pp. 30-31.
[39] These treaties are known as the Douglas treaties.

There are two significant aspects to the inclusion of aboriginal and treaty rights, including future treaty rights, in the Constitution. First, those rights are now entrenched and cannot be unilaterally amended or extinguished by either Canada or a province. Second, any law that unjustifiably infringes an aboriginal or treaty right is of no force or effect to the extent of the inconsistency.

Aboriginal rights

While the courts have clarified some aspects of the rights of First Nations to land and resources, they have not yet dealt with others. The Supreme Court of Canada has considered the extent of aboriginal rights in a number of decisions,[40] primarily in the context of an aboriginal right to fish for food and ceremonial purposes. A number of principles emerge from these decisions:

- legislative interference with aboriginal rights is only justified if the legislative objective is sufficiently compelling and substantial to be valid;
- conservation of a resource and, therefore, preservation of the subject of the aboriginal right and the need to ensure public safety may justify interference with an aboriginal right;
- the aboriginal right to fish will have priority over other the rights of other users;
- where trade in fish was integral to the culture of a First Nation prior to contact, there may be a constitutionally protected aboriginal right to fish to exchange fish for money or other goods or to sell fish commercially;
- both the federal and provincial governments have a special trust relationship with First Nations; the requirement of justifying infringements of aboriginal rights is one way of holding the Crown to a high standard of honourable dealing;
- First Nations must be consulted by government when government is planning activities that potentially affect aboriginal rights;
- to be an aboriginal right an activity must be an element of a practice, custom or tradition integral to the distinctive culture of the aboriginal group claiming the right;
- to be integral, a practice, custom or tradition must be of central significance to the aboriginal society in question, one of the things which made the culture of the society distinctive;

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[40] *R.* v. *Van der Peet*, [1996] 2 S.C.R. 507, 137 D.L.R. (4th) 289 (S.C.C.); *R.* v. *Gladstone*, [1996] 2 S.C.R. 723, 137 D.L.R. (4th) 648 (S.C.C.); *R.* v. *N.T.C. Smokehouse Ltd.*, [1996] 2 S.C.R. 672, 137 D.L.R. (4th) 528 (S.C.C.); *R.* v. *Nikal*, [1996] 1 S.C.R. 1013, 19 B.C.L.R. (3d) 201 (S.C.C.); *R.* v. *Cote*, [1996] 3 S.C.R. 139; *Delgamuukw* v. *British Columbia*, [1997] 3 S.C.R. 1010; 153 D.L.R. (4th) 193; and *R.* v. *Marshal* [1999] 3 S.C.R. 456; 177 D.L.R. (4th) 257.

- the practices, customs and traditions which constitute aboriginal rights are those which have continuity with the practices, customs and traditions that existed prior to contact with European society;
- the practice, custom or tradition must be independently significant to the aboriginal community claiming the right and cannot exist simply as an incident to another custom or tradition; and
- only aboriginal peoples can exercise aboriginal rights.

These principles have been expressed by the Court primarily in relation to the aboriginal right to fish. An aboriginal right to forests and non-timber forest products has not been definitively established and described by the Supreme Court of Canada. However, it is likely that the Court will find that other aboriginal rights exist, including the right to harvest non-timber forest products. The principles set out above could be applied to any other aboriginal rights.

As a result, any attempt at regulation by the provincial government of a First Nation's harvesting of non-timber forest products likely would be subject to scrutiny under these principles. To repeat these principles in the context of harvesting non-timber forest products:

- conservation of non-timber forest products will have priority over the rights of First Nations to gather non-timber forest products for food and ceremonial purposes;
- First Nations people with an established aboriginal right to harvest non-timber forest products must be given priority over other users; this may not be the case for an aboriginal right to harvest non-timber forest products for commercial purposes;
- First Nations with an aboriginal right to harvest non-timber forest products must be consulted by the provincial government about non-timber forest products management decisions that might affect their right;
- an aboriginal right to harvest non-timber forest products can only be infringed if there is a substantial and compelling legislative purpose such as conservation or public safety.

Aboriginal title

The Supreme Court of Canada decision in *Delgamuukw v. British Columbia* definitively established the existence of aboriginal title. It ruled that aboriginal title exists and has not been extinguished. The Court described the scope of protection afforded Aboriginal title under subsection 35(1) of the *Constitution Act, 1982*; defined how Aboriginal title may be proved; and outlined the justification test for infringements of Aboriginal title.

The Court explained that aboriginal title is a kind of constitutionally recognized aboriginal right and identified a number of attributes of aboriginal title, including:

- it is a proprietary interest that is in a class by itself;
- it is non-transferable – lands held pursuant to aboriginal title may be transferred or surrendered only to the Crown;
- it is communal in nature, in that aboriginal title is a collective right to land held by all members of an aboriginal nation;
- it includes the right to exclusive use and occupation of the title to land for a variety of uses:
  a) the exclusive right to use the land is not restricted to the right to engage in activities which are aspects of aboriginal practices, customs and traditions integral to the First Nation's distinctive aboriginal culture;
  b) however, land use must not be "irreconcilable with the nature of the group's attachment to that land" so that the relationship of an aboriginal community with its land should not be prevented from continuing into the future;
  c) if aboriginal peoples wish to use their lands in a way that aboriginal title does not permit, then they must surrender those lands and convert them into non-title lands to do so;
  d) aboriginal title is a right to the land itself and the land may be used, subject to the inherent limitations of aboriginal title, for a variety of activities, none of which need be individually protected as aboriginal rights;
  e) aboriginal title encompasses mineral rights and lands held pursuant to aboriginal title should be capable of exploitation.

However, the Court reiterated in *Delgamuukw* that no constitutionally recognized aboriginal rights are absolute, including aboriginal title. They may be infringed by the federal and provincial governments if the infringement furthers a compelling and substantial legislative objective and is consistent with the special fiduciary relationship between the Crown and aboriginal peoples.

The Court identified the development of agriculture, forestry, mining and hydroelectric power, the general economic development of the interior of British Columbia, protection of the environment or endangered species, and the building of infrastructure and the settlement of foreign populations to support these goals as examples of compelling and substantial legislative objectives.

The Court reiterated the need for the involvement of aboriginal peoples in decisions taken with respect to lands to which they hold aboriginal title. The Court said there is always a duty of consultation.[41] Finally, the Court noted that compensation is relevant to the question of justification as well and that fair compensation will ordinarily be required when aboriginal title is infringed.

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[41] See the discussion below.

The full consequences of this decision on land and resource management in British Columbia are not yet clear.

3.3.3 Land claims

The extent of aboriginal rights and title on public land has not yet been established in British Columbia. The *Delgamuukw* decision is expected to have significant repercussions on the future negotiation and settlement of comprehensive land claims based on aboriginal title, land use policy and aboriginal title litigation in those regions of the country where traditional aboriginal lands have not been ceded by treaty. This includes most of British Columbia.

Some First Nations are involved in tripartite treaty negotiations with the federal and provincial governments as a way to address their land claims. Other First Nations are involved in other land claims processes such as direct negotiations with the federal government and litigation.

Interim Measures Agreements have been negotiated in the treaty process to address land and resource management and protection before a treaty has been negotiated.

3.3.4 Consultation

The Supreme Court of Canada has repeatedly identified the need for consultation of First Nations if government actions have the effect of infringing aboriginal rights or title. In *Delgamuukw*, the Court stressed the need for the involvement of aboriginal peoples in decisions taken with respect to lands to which they hold aboriginal title. The Court said there is always a duty of consultation. However, the Court added that, in most cases involving aboriginal title, the duty will be significantly deeper than mere consultation, in some cases requiring agreement by the affected First Nation to any land use decisions.

Very recent court decisions have clarified that the duty to consult is an enforceable, legal and equitable duty and that seeking accommodation of First Nations interests and concerns is part of that duty.[42] The Crown has a duty to consult and seek an accommodation with First Nations whether or not the existence of aboriginal rights or title has been proved. The courts have said that tenure holders or potential tenure holders may also have this same duty.

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[42] See *Taku River Tlingit First Nation* v. *Ringstad*, 2002 B.C.C.A. 59; *Haida Nation* v. *B.C. and Weyerhaeuser*, 2002 B.C.C.A. 147.

4. The role of property rights in resource stewardship

In the *Tragedy of the Commons*, Garrett Hardin (1968) describes the consequences of population growth and "social stability" on a grazing pasture open for all to use. In an effort to maximize one's benefit from the pasture, each herdsman invariably rushes towards destruction of that same pasture, driven by an individualistic character and an inability to cooperate with fellow herdsmen. As populations have increased, restrictions on a variety of "commons" have occurred throughout the world. Are restrictions on all "commons" necessary? Hardin argues that existence or maintenance of any "commons, if justifiable at all, is justifiable only under conditions of low-population density" (Hardin 1968, p. 18).

Some authors (for example, Ostrom 1990; Richards, 1997) tend to disagree with Hardin's suggestion that the only recourse is to either privatize or socialize the resource. Part of this disagreement stems from the belief in the potential efficacy of common property regimes (note the difference between common property regime and a common pool resource[43]) within the property rights continuum. What each author does agree with, however, is that the answer to the "tragic" potential awaiting CPRs is the development of an effective, clearly defined, acknowledged and enforceable, or accepted, set of property rights, be they private, state, or common property. In other words, some form of formal state (*de jure*) or informal (*de facto*) institutional norms and principles guiding resource use must exist to ensure resource stewardship, at least for those resources experiencing high or increasing values. The goal of each system, whether informal or formal, is to provide the appropriate incentives, regulations or cooperation in order to avoid the "tragedy of the commons." Yet how do we know which approach is appropriate for any particular resource, especially for the significant variety of products under the NTFP umbrella?

The purpose of this section is to discuss the role of property rights from an economics perspective and the implications of poorly defined property rights. This section will lead into a discussion of a range of institutional responses and examples of their role in resource management in an effort to highlight the most efficacious framework for NTFPs.

4.1. Property rights and the economy

4.1.1. Natural resource economics.

Why should we be concerned about the role of economics and property rights in the way in which we use natural resources? At the most basic level economics "is the social science that deals with allocating scarce resources among competing means to satisfy human wants"

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[43] "…the term 'common pool resource' is used to refer to the physical quantities of resource systems and not to the social institutions that human beings have attached to them. 'Common property' or 'common property regime' is used to refer to a property rights arrangement in which a group or resource users share rights and duties towards a resource." (McKean and Ostrom, 2001, p3)

(Gregory, 1987, pp. 1). The efficient allocation of resources means that the factors of production - labour, land and capital - are used in such a way that society enjoys the greatest net benefit. The determination of this most efficient balance in the use of resources would ideally consider the full range of both costs and benefits, and would lead to equilibrium in the supply and demand of these resources. In the real world, however, this allocative efficiency and market equilibrium is rather illusive and difficult to achieve.

There are numerous reasons why markets do not achieve the ideal described in the previous paragraph. Market imperfections, or failures, occur, among other reasons, as a result of a lack of perfect knowledge, imperfect factor markets, and externalities, all of which lead to prices that do not properly reflect the value of resources (Pearse, 1990). Externality is the topic of greatest interest in this discussion, or more specifically public goods externality (collective goods or common pool resource externality are closely related to a public goods externality and are the focus in this study) and technological externality.

A collective or common pool externality results from a resource that is open to all, yet is also rivalrous, or subtractible. This differs from a public good, which is not rivalrous and can be enjoyed by anyone at the same or any time. However, common pool and public goods are similar in that there is no incentive for any one person to provide or invest in the good, as that person cannot be guaranteed, at a reasonable cost, to reap the benefits. The inevitable result is poor or no stewardship of the resource, eventually leading to the "tragedy of the commons." A technological externality is one in which the actions of one sector affect, negatively or positively, other values or benefits that could be accrued from a resource. Environmental degradation is the most obvious example. The existence of negative externalities and the resulting sub-optimal level of social welfare is a main, but not the only, reason for government intervention in the market place (van Kooten, 1993).

NTFPs are subject to both externalities. As a result, there is little incentive for users to invest in or conserve the resource, unless the benefits of these actions can somehow be protected, for example in a remote mushroom patch known to one or few people, and if the area is protected from other resource use. Yet even in this situation the level of uncertainly and risk is not likely reflected in the potential return from any investment. The extraction of some NTFPs may have a detrimental effect on the long-term productivity of the resource or on the biodiversity of the entire area and there are a large number of research projects underway or completed that are based on this potential outcome (see for example Turner and Cocksedge, 2001; Amaranthus and Pilz, 1994). Timber harvesting causes a negative technological externality by precluding any edible wild mushroom harvesting for several decades in a specific area; however, some partial cutting systems may allow both timber and mushroom harvesting to coexist temporally as well as spatially (Kranabetter and Kroeger, 2001). Timber harvesting may also ensure an appropriate overall age class structure[44] for longer-term mushroom production, thus providing positive benefits as well (Pilz and Molina, 1996) Pine mushrooms are found in a range of forest stands aged between 80 to 160 years in northwestern British Columbia (Trowbridge, et al 1999), from 35 to 80 years in the Oregon

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[44] Age class is not the only condition for mushroom fruiting. Other conditions include soil characteristics, climatic conditions, elevation, and forest stand-type (see Berch and Wiensczyk 2001; Hosford et al 1997).

Dunes Recreation Area, and from 60 to 120 years in the Southern Cascade range (Hosford et al, 1997).

4.1.2. Property rights and natural resource economics

In both cases of externality discussed in the previous section, a lack of well-defined property rights (either formal or informal) in the resource is a distinguishing characteristic. Property rights are a set of institutional arrangements that reflect the structure of rights to land and its use, the consequences of social interaction, and the origins of the property rights structure (Wang and van Kooten, 2001). Property rights "form the interface between law and … economics…;" economics "deals with the buying and selling, or leasing, or using, property rights" (Dales, 1968, pp.172-3). If property rights are not provided or are not well enough defined, then the market will not achieve an efficient allocation of resources (Dales 1993; Grafton et al 2000; Swanson and Goschl, 2000). "The nature and distribution of property rights are critical in determining how resources are used and conserved" (Wiebe and Meinzen-Dick 1998, p. 205). This suggests then that well-defined property rights to NTFPs would increase the efficiency of NTFP use and subsequently society's welfare. As Pearse (1990:175) explains:

> Economists put great importance on property because it governs the efficiency of resource use throughout an economy as well as the distribution of income. In the theory of the pure, perfectly competitive market system all factors of production are owned privately and property rights are complete, in the sense that they are not restricted or qualified. … With unrestricted rights to do whatever they want with their assets, owners are constantly driven by incentives to put them to their highest and most rewarding use, thereby contributing to social welfare."

As described in Section 3, property rights consists of a set of characteristics including comprehensiveness, exclusivity, transferability, divisibility, duration, and enforceability.[45] The most significant components are exclusivity and enforceability, although the attenuation of any component (transferability for example) may reduce the value of the property right and diminish the incentives for any one individual or entity to efficiently use the resource from society's perspective (Grafton, 2000).

The following table provides a useful typology of property rights and their characteristics and is adapted from Wang and van Kooten 2001, and Pearse 1990.

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[45] The property rights literature uses various comparable descriptions of what is included in the characteristics of property rights. The most common are considered in this report. For a discussion in a variety of settings including forestry see for example Dales 1968; Haley and Luckert 1986, 1990, Pearse 1990; van Kooten 1993; Grafton 2000).

Table 1: Property rights typology.

	Property rights degree of definition	Exclusive characteristics	Implications for economic incentives
Private property	Well defined, complete property rights.	Exclusive rights assigned to individuals.	Strong incentives for conservation of resources and investment.
State ownership	Less defined for individual use, usufruct rights generally given in form of leases, tenures or permits.	Rights held collectively with control exercised by authority or designated agency.	Creating opportunities for attenuation of rights; managers have incentives for personal gains.
Common property	Restricted or stinted users, multiple quota rights or other reserves for special users.	Exclusive rights assigned to all members of a community; approaching private property.	Creating free-riders problem and low incentives for conservation.
Open access	Unlimited users and uncontrolled access.	Exclusive rights unassigned.	Lack of incentives to conserve; often resulting in resource degradation.

Source: adapted from Wang and van Kooten, 2001, pp. 15; and Pearse, 1990

In British Columbia, property rights to public land resources are generally based on usufruct rights. Usufruct is defined as the legal right of using and enjoying the benefits or profits of something belonging to another. In other words, individuals or business entities receive the right to *use and profit* from a resource, but do not have ownership of the resource itself; the ownership of the resource remains with the Crown. Examples of usufruct rights to resources include forestry tenures, such as area based "tree farm licences," or volume based "forest licences." British Columbia uses many other forms of usufruct rights to public resources. For example, grazing tenures provide the right to use a certain amount of land as a feed source, guide outfitting tenures provide specific rights to areas of land for hunting and photography tours, backcountry recreation tenures are provided to operators involved in such things as helicopter skiing adventures. Fishing and hunting licences are also a form of usufruct rights and provide restricted access to resources.

These examples of licences and tenures provide either exclusive or non-exclusive rights to an area or resource for specific purposes. They do not, however, provide exclusive rights over all areas and all resources, or complete and unfettered use of resources. This attenuation of property rights can affect property's value; however, placing limits on the use of property is designed to ensure that society does not pay for the negative externalities of unrestricted land use – at least in theory. Thus, the use of all land in Canada, including private land, is to some degree regulated, controlled or influenced by the state. Unfortunately, not all state norms and principles designed to address externalities are completely effective or use the most efficient methods (for example see; Haley and Luckert 1990, 1998; Stanbury and Vertinsky 1998).

If strengthening property rights will create the necessary incentives for better stewardship of our resources, what economic considerations should influence our design of the most appropriate property rights regime? Coase (as cited in Swanson and Goschl 2000, and Wang and van Kooten 2001) theorised that if property rights were completely specified (i.e., a greater emphasis was placed on providing full and unfettered private property rights) then actors would be able to more easily resolve the existence of externality and achieve a socially efficient allocation of resources. Unfortunately, the existence of transaction costs renders this theory rather unworkable in real world situations. Acknowledging transaction costs is critical, especially in circumstances where there are many users of the resource and multiple levels within the production process (Swanson and Goschl 2000). Wang and van Kooten (2001) identify other characteristics that indicate the limitations of the market mechanism: 1) information is imperfect; 2) transaction costs and market failures do exist; 3) price is not the only consideration in market transactions and other social and legal ties exist; and 4) institutions can have a significant impact on the economic system.

We cannot assume that the simple answer to managing NTFPs is providing more well-defined and exclusive rights to the resource. Outlining the complexity of managing NTFPs is the existence of high transactions costs associated with coordinating resource users to overcome investment, enforcement, and conservation issues; existing informal networks and agreements; a multi-level market structure; the institutional foundation (i.e., the existing system of usufruct rights to resource); and First Nation's claims to land and resources. Addressing these and other management challenges means that stakeholders must coordinate their use in some way or through some mechanism. Thus the starting point to designing an appropriate management regime for NTFPs is to identify the most appropriate institutional framework and its coordinating mechanism.

Institutions are defined as "humanly devised constraints that structure human interaction. They are either formal or informal: formal institutions consists of state created or supported constraints, e.g., policy rules, regulations, laws, constitutions, contracts, property rights, bargaining agreements, [while] informal institutions concern informal constraints, e.g., norms of behaviour, conventions, self-imposed codes of conduct" (CPB 1997 p. 42, as quoted in Wang and van Kooten, 2001, p. 18). Governing institutions provide the foundation for private, state and common property approaches to social and economic organization.

Private, state or common property systems can only function if adequate and appropriate institutional principles and norms are established to provide users of the resource with the means of coordinating their actions. The appropriate institutional framework "can only be well designed with reference to identified goals" (Haley and Luckert, 1990, p. 14). For forest resources the concept of flows and stocks are important and the "institutional arrangement for selling forest products (flow units) are quite likely to be different from those controlling and managing the forest stock (the resource)" (Arnold, 1998, p. 2). No particular mix of institutional arrangements, whether through private entities, the state or the users of the resource can guarantee successful stewardship of CPRs, yet the success stories are often a "rich mixture of public and private instrumentalities" (Ostrom, 1990, p. 182).

Wang and van Kooten (2001) outline a range of four coordinating mechanisms:

1. competition;
2. cooperative exchange;

3. common values and norms; and
4. control.

Each mechanism may be more appropriate for particular products and within certain social structures and the "ability to implement a coordination mechanism (if at all) depends crucially on the existing institutional arrangements" (Wang and van Kooten, 2001, p. 21). Alternative coordinating mechanisms may also be necessary for each externality in question, i.e., there may be a different response required to overcome a common pool externality versus a technological externality. Within each mechanism there are further methods to achieve the desired outcome; for example, available to policy makers using conventional state regulatory approaches are coercion, incentive, or preference focused instruments (see Stanbury and Vertinsky, 1998). Each mechanism has its strengths and weaknesses, making some approaches to resource management not necessarily applicable in all cases. For CPRs, enforcement weaknesses associated with a lack of cooperative and common values reduce the efficacy of common property approaches. Conventional state regulatory approaches have strong enforcement capabilities and private or individual rights are associated with competition based incentives. These characteristics may provide an insight into the possible mix of institutional approaches for NTFPs.

These coordinating mechanisms and institutional foundations are at the heart of the design of an appropriate management regime for NTFPs in British Columbia. Prior to any description or definition of the property or usufruct rights, determining the appropriate institutional approach is necessary. After a discussion of specific economic concerns related to NTFPs, Section 4.3 presents the institutional approaches in more detail.

4.1.3. Common pool resources and economic failure

As indicated in the previous discussion, common pool resources, such as non-timber forest products, lead to a type of externality similar to a public good, and add a particular complexity to the goal of resource stewardship. Common pool resources can exist at any level of land ownership from open access to private. For example, an area of private land may have various valuable salal sites, but landowners may have a very difficult time enforcing exclusive rights to the product or area, and cannot at a reasonable cost guarantee that there will be no trespass. This scenario is currently occurring in the Pacific Northwest where private landowners are dealing with an increasing problem of trespass (Craig Marbet, Simpson Timber Co. pers. comm.). Salal on these private lands may be owned privately, but restricting access and ensuring exclusivity can be highly problematic.

The following five economic characteristics reflect NTFPs to varying degrees and provide more specific details to the general externality terminology:

1. a high discount rate;
2. a lack of investment in the resource;
3. rent dissipation;

4. transaction costs; and
5. the distribution of income.

Discount rate

A discount rate is simply an interest rate that allows a comparison of future values with today's values. Future values are "discounted" to tell us, for example, if we value harvesting a resource today more (or less) than harvesting at a later date. The higher the discount rate, the less value we place on future harvests. NTFP harvesters have extremely high discount rates, meaning they have the incentive to pick all the product today, for fear that someone else will follow and harvest any product left behind. Any investment in the resource would require immediate returns. High discount rates may actually create some perverse investment incentives for NTFPs; for example, dollars spent on equipment and technology to more easily find and harvest a larger volume could lead to greater resource degradation. This short-term perspective not only has implications for conservation and stewardship of the resource, but also affects the total value of the product. For example, some mushroomers will harvest a patch of chanterelle buttons too early when leaving the patch for a day or two would increase the size, and subsequently the total weight and value of the resource. In this case the harvester is actually foregoing future income, but not necessarily his or her own. Distributors of NTFPs may have a lower discount rate for NTFPs that have been harvested and that are under the possession of the company. In this case, what was a CPR has taken on more of the characteristics of a private good, which is reflected in the level of investment in processing and shipping infrastructure. What is the implicit discount rate of NTFP harvesters, buyers, and distributors?

Lack of resource investment

A corollary to the high discount rate is a lack of investment in the resource, which reflects the difficulty of assuring that an investor will be able to reap the benefits at some time in the future. This lack of incentive to invest is the result of open access to the resource and an inability to exclude others at a reasonable cost. Would the NTFP industry be willing to invest in the resource if exclusive rights were possible? How could the problem of free riders be avoided? What investment in the land base already occurs and benefits NTFP production? Who pays for that investment?

Rent dissipation

Rent dissipation occurs when the landowner or other member of the production process captures little or none of the resource rent (i.e., value of the resource to the landowner) because of high production costs due to an inefficient allocation of resource rights, production processes and market organization. Users of the resource are unable or unwilling to organize in some manner to prevent rent dissipation (Grafton, 2000). For example, the high costs of shipping chanterelles from the Queen Charlotte Islands could be partially offset if mushroom buyers were to cooperate to a greater extent in the shipment of product by truck. Trailers may take longer to fill, will be transported at less than full capacity, or will sit for too long, subsequently affecting product freshness and value. These inefficiencies lead to higher costs per unit shipped and diminish the potential return to the resource owner. The dissipation of rents also occurs because the land owner (i.e., the Crown) chooses not to collect a fair market value, or rent, for NTFPs, thereby allowing harvesters or buyers to capture or squander it. Is the rent associated with the use of NTFPs captured by industry or is it fully dissipated in high per unit costs, product wastage, or inefficient industry organization? What is the rent, how should it be determined and can it, or should it be captured by the landowner?

Transaction costs

Transaction costs have to do with the costs associated with two or more resource users cooperating to overcome an inefficient allocation or use of resources. If the resource user knows that the marginal benefits of an alternate management agreement will exceed the marginal costs, then there is a far greater likelihood that the resource user would participate in, or cooperate with the new system. However, organizing the many players, and identifying and quantifying the costs is a difficult and uncertain endeavour for resource users. With no coordinating mechanism bringing users together, there is little chance that the NTFP industry will collectively address resource issues. Can government reduce uncertainty and transaction costs to help reveal the net benefits from resource management and user cooperation?

Transaction costs also include the costs associated with enforcing property rights to NTFPs. One of the most challenging and important considerations when designing an effective property rights regime for NTFPs is that enforcement of the property right could be onerous and costly. This reduces the number and type of management responses available to decision-makers. Can an appropriate institutional approach and management regime reduce or eliminate the costs of enforcement?

Distribution of income

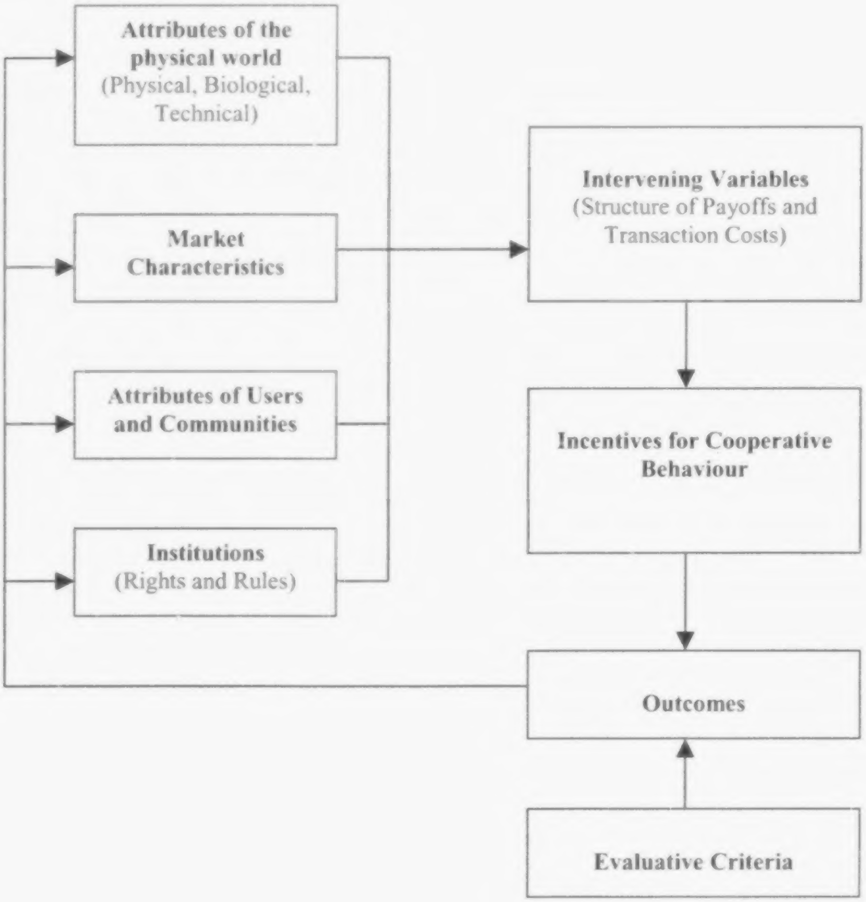
The existing distribution of income, i.e., current users who benefit from the resource, is a feature of the current social and institutional setting. The danger in designing a management regime and imposing it on an existing (though informal) allocation of resources is that the current users may be adversely impacted and omitted from the new system. Thus, replacing one system of resource use with another may shift the distribution of income and harm the original and in many cases the weaker members of society. Can current users of NTFPs be protected with a formal management regime, or must they accept change and an alternate role in the industry?

4.2. Institutional approaches to managing common pool resources such as NTFPs

The literature examining CPRs generally focuses on three basic institutional approaches to overcome externalities: private, state and common property (see for example McKean and Ostrom, 1995; Grafton and Squires, 2000; Grafton, 2000; Arnold, 2001). What creates the coordination of users within these approaches was identified by Wang and van Kooten (2001) as ranging from private sector-based competition, to state-based conventional regulation, with various cooperative or communal systems in between. A further type of property rights (or lack thereof) is open access, but is excluded from discussion here as it is not a reasonable approach to overcome a CPR management dilemma. In some cases, private regimes are preferable, while in others more of a conventional state regulatory regime is required, and in others a cooperative management regime involving the community of resource users collectively holding some private form of rights may be most beneficial. Other possibilities include a combination within the range. A model for analyzing CPR situations is presented in Figure 1.

Figure 1: A model for analyzing CPR situations.

(From Mitchell, 1997: p. 48)


Attributes of the physical world
(Physical, Biological, Technical)
Market Characteristics
Attributes of Users and Communities
Institutions
(Rights and Rules)
Intervening Variables
(Structure of Payoffs and Transaction Costs)
Incentives for Cooperative Behaviour
Outcomes
Evaluative Criteria

Prior to any move towards institutional change, users, or "appropriators," of the resource must be able to recognize the costs and benefits of change. If the benefits of change do not clearly exceed the costs of both change and the enforcement of the new rules, users will not willingly adopt the new management regime. Choosing which alternative may successfully address a particular CPR depends on a range of characteristics, or as Ostrom (1990) calls them "situational variables" that relate to the costs and benefits of change and the ability to accommodate the new rules of management. Hanna et al (1996: p. 20) observe that the match or fit between biophysical and human systems is key to the success of any given property rights regime:

> Property rights regimes link ecological systems to human systems. The linkage they make is specific to context because they connect a particular human system, with its unique economic, legal and social structure, to a particular ecological system, with its unique biophysical structure. The overriding characteristic of an effective linking mechanism is that it reflects the properties of the ecological and human systems it connects.

Fundamental to the efficacy of any approach to managing CPRs are "institutions that authorize and secure use by a particular group of users (to the exclusion of others)" (Arnold, 1998, pp. 2). It is important to remember at this point that the commercial NTFP industry is not new and has operated for many decades, although not always at its current intensity. It may not be necessary, however, to provide separate rights based on areas or product, or to simply provide it to existing tenure holders based on ease of implementation. There must be adequate reasoning behind any option and it must be compatible with the particular resource. The danger in providing new rights to existing timber tenure holders is that they may place a lower value on the CPR, thus continue to omit them from resource management.

Property rights can be conferred for specific resource uses and can be overlapped with other resource rights. These "partial interests" are a common feature in state held lands. The formalization and transferability of partial interests to resources in the United States, for example, has provided a "more refined alternative to establishing or trading full ownership rights … and have been used as policy tools … primarily to deal with environmental externalities" (Wiebe and Meinzen-Dick, 1998, p. 204, 209). The ability to transfer these rights provides a more explicit value, yet the highly complex web of partial rights also requires "a well functioning institutional infrastructure for ongoing monitoring and enforcement" (Wiebe and Meinzen-Dick, 1998, p. 211).

Thus, rather than moving towards a concentration of property rights as a means of administrative ease and using a system of resource management that may have a higher potential of displacing existing informal arrangements, partial interests in resources can provide a means to accommodate a wider range of society's values and resource stewardship approaches, at perhaps less cost in relation to an outright shift to private property rights, yet with potentially higher initial institutional transactions costs. These overlapping rights may be best provided through a combination of institutional approaches.

The following discussion defines each of the approaches and provides some guidance as to the most beneficial path for NTFPs in British Columbia.

4.2.1. Private property approaches

Private property based regimes can best be described as providing the most well defined, or complete property rights of the three approaches, although the state generally imposes some limitations. Forms of private property rights can include both the stock of resources, as with forest land held in fee simple, or can be limited to the flow of a particular resource, such as a tree farm licence that provides exclusive use of timber only.

Complete property rights implies a greater degree of "privateness" such that, among other assuraces,

- the holder of these "rights" enjoys a **comprehensive** right to a full range of benefits from the land or resource in perpetuity or for a reasonable **duration**;
- has the **exclusive** right to those benefits;
- has the ability to **transfer** or sell all or some of the property rights; and
- the rights are **enforceable**, in that these rights are protected by the State.

The value of the property or rights conferred depends not only on the inherent physical and economic characteristics of that land and its resources, but also the ability of the rights holder to enjoy the benefits from the land and resources (Pearse, 1990). The attenuation of any of these components will reduce the ability of the rights holder to exersize free choice, thus lowering the value of the rights to the holder and others who may wish to acquire them.

The ability of private property regimes to overcome the challenges of managing a CPR depends to a large extent on the enforcement costs associated with guaranteeing exclusion. Grafton (2000) identifies this cost issue and three other conditions affecting the potential efficacy of a private property response to a CPR problem:

- the costs associated with exclusion being lower than the benefits of privatization;
- the existence of high non-market values not available for appropriation, leading to sub-optimal management decisions;
- the gap between the private and social rate of discount, which could lead to a more rapid or too slow use of the resources from a societal perspective; and
- the potential re-distribution of wealth that may occur as a result of the transfer of rights to a private entity.

For some forest resources, more defined and complete property rights would arguably improve the way in which we manage our forests. Authors such as Haley (1985) Haley and Luckert (1990), and Pearse (1998) argue that strengthening property rights to forest resources would increase the management effort and value we accrue from the forests, at least in terms of timber, but also other forest resources if they are also included in the comprehensiveness of the tenure or ownership right. Investment in silviculture (therefore other resource needs) also hinges on the security of tenure, with greater security leading to more investment (Zhang and Pearse, 1996).

NTFPs are characterized by the appropriation of the resources by a relatively small number of distributors/exporters, and the transformation of the product from a common pool resource stock with no apportioned rights, to a flow that once harvested and in possession of a buyer more closely resembles a private good. Thus, unless the industry is horizontally integrated for management purposes, from harvesting to distribution, there may be little chance of gaining the same benefits for the flow (where any investment in NTFPs is currently focused) as for the stock.

While providing private rights to NTFPs may lower the current high discount rate associated with harvesting and could lead better resource stewardship, the responsibility for the costs of exclusion would likely fall on government in an effort to provide some guarantee of exclusiveness of tenure. In this case the costs of administration and enforcement may far exceed the benefits. Even for established timber companies with areas based tenures, the value of **not** administering an NTFP program may exceed the value of providing access to the resources. Subsequently, providing more comprehensive rights to a greater variety of forest resources or values may simply lead to forest companies limiting access to avoid the costs of managing, thereby displacing current users of the NTFP resource, or at least pushing them further from view.

The difficulty here is not so much with the idea of "private ownership," which could extend over a very large geographic area and could overcome problems with exclusion and substraction. The difficulty is with bundling rights to resources of widely differing values, such that the private benefits believed to accrue to the property owner from one group of resources (e.g., timber) exceed the private benefits that accrue from others (NTFPs), that the social benefits that could flow from harvesting all of these resources are not realized. If the single owner attached as much importance to each resource as society does, then private ownership of the bundle of resources would not be problematic in this sense. NTFPs are rather like "bycatch" in a fishery –non-target species have value, but not to the people who catch them.

4.2.2. State management approaches

Grafton (2000: p. 507) describes state management approaches as "where the state owns the resource stock and sets the rules governing withdrawal and access." As such, state ownership of the land is not equivalent to state management, or state rights based property regimes. "Failure by government to exersize proper control over the resource, via management and enforcement, can and often does lead to open access exploitation, and its attendant problems" (Wang and van Kooten, 2001: p. 14).

The NTFP industry can certainly be characterized by a lack of "proper" control over the resource. In British Columbia, the majority of the land base (94%) is state owned, or public land. While the timber industry is provided access to forest resources through a variety of usufruct-based rights with the provincial government guiding management conditions, NTFPs are not managed under a similar, or in fact any state-based management regime.

The potential benefits of the state managing a CPR is that it can overcome difficulties associated with the coordination of numerous "appropriators" of the resource (Grafton, 2000). The state, unlike a private entity, is also more likely to place a higher value on societal beliefs and would include non-timber costs and benefits and distributional, or equity issues in resource management. Further, the state can overcome economies of scope, in terms of managing a large area and multiple resources associated with high diversity and uncertainty.

Grafton (2000) also outlines the potential failure of state-based rights, regardless of the various benefits that may initially make this approach appear attractive. Most of these failures occur as a result of the state applying formal legal rights over the resource that changes or supersedes existing community or common property based informal norms and principles. Failure can also result in jurisdictions where sufficient funds are not available to undertake the appropriate level of monitoring and enforcement. In this situation even if economies of scope are achieved, enforcing the laws is often too costly and transgressions occur at an increasing rate as users of the resource abandon the new system.

For NTFPs, conventional state-based regulatory approaches to resource management could provide the coordinating mechanism necessary to bring together a disparate group of resource users. However, it is unlikely that a management regime could be successfully developed by relying solely on state management, monitoring and enforcement - costs may far outweigh any noticeable benefits. NTFPs are characterized by their product heterogeneity, geographic dispersion, a large number of users (least at the resource extraction level) and high costs associated with monitoring and enforcement. As such, they are inherently difficult to manage from a typical state regulatory or private property perspective.

4.2.3. Common property approaches

Common property regimes, similar to the private property model, are characterized by a well-defined bundle of rights. They are not, as sometimes thought, synonymous with open access and unregulated exploitation. Common property "is used to refer to a property rights arrangement in which a group of resource users share rights and duties toward a resource" (McKean and Ostrom, 1995: p. 3). Thus similar to private rights, which are provided to a person or business entity, common property provides a similar level of rights, but to a common group, or community of users. "It is crucial to recognize that common property is *shared private property* and should be considered alongside business partnerships, joint-stock corporations and cooperatives (McKean and Ostrom, 1995: p. 4). The "community" takes a substantial role in the day-to-day operation and management, and provides the necessary monitoring of resource use and for transgressors of the rules.

Management rules and responsibilities often reflect informal rights that may have developed over many generations, but which require the approval and support (or protection) from the state. "Common property is created when individuals agree to limit their individual claims over a resource in the expectation that other group members will do the same" (Richards, 1997: pp. 96). Thus, "common property is not access open to all but access limited to a specific group of users who hold their rights in common" (McKean and Ostrom, 1995: p. 3). "Common property regimes are a way of privatizing the rights to something without dividing it into pieces. Common property also offers a way of parcelling the flow of skimmable or harvestable 'income' (the interest) from an interactive resource system without parcelling the principal itself" (McKean and Ostrom, 1995: p. 4).

McKean and Ostrom (1995) identify several advantages of common property regimes in the management of common pool resources:

> *Indivisibility*. The resource may have physical traits that make it unamenable to physical division or demarcation. Either the resource system cannot be bounded (the high seas, the stratosphere) or the resources in question may be mobile over a large territory (air, water, fish, wildlife). Such resources have to be managed in very large units. Forests may seem much more divisible at a first glance than other kinds of resources systems. However, forests need to be managed in large units, particularly where they are being managed not only for products that can be removed but also for their environmental protection value, both at micro and macro levels. Even in strictly production forests, economies of scale often argue against fragmentation, especially in terms of management costs.
>
> *Uncertainty in location of productive zones*. In fragile environments nature may impose great uncertainty on the productivity of any particular section of a resource system, and the location of the unproductive sections cannot easily be predicted from year to year, even if the "average" or "total" productivity of the entire area is fairly steady over time. In this situation, the resource system is stationary and may even have obvious boundaries, but the productive portions are volatile. In such resource systems, resource users may well prefer to share the entire area and decide together where to concentrate use at a particular time, thereby sharing risks and benefits rather than parceling the area into individual tracts and thus imposing the total risk on some of their members (those whose parcels turn out to be bad ones at that particular time).
>
> *Productive efficiency through the internalization of externalities*. In many resource systems, watershed catchments for instance, uses in one zone immediately affect uses and productivity in another: deforesting a hillside ruins the water supply and downhill soil quality. If different persons own the uphill forests and the downhill fields or, for that matter, small adjacent patches of forest and pasture - and make their decisions about resource use independently

> and separately, they may well cause harm to each other. If these externalities are substantial, the owners/users will want to negotiate mutually beneficial contracts (Coase, 1960). Either the downhill farmers would pay uphill forest owners not to cut all the trees they might want to, or uphill forest owners would cut all the trees they want to and, instead, compensate downhill farmers for damaged fields with the extra earnings from timber sales.
>
> An institutional alternative to this series of bilateral exchanges is to create a common property regime to make resource management decisions jointly. People who use a common property regime to manage a catchment area may all share ownership of the upland forests, manage forest harvesting to prevent soil erosion and damage to fields below, and earn more from their downhill farms than what they sacrifice by not cutting as much uphill timber. Common property regimes may become the desirable option when more intensive resource use multiplies externalities between parcels and increases collective agreement on fairly restrictive use rules, and when collective enforcement of those rules becomes easier (less time, lower transaction costs for the owners) than endless one-on-one deals.
>
> *Administrative efficiency.* Even if resources are readily divisible into parcels, the administrative support to enforce property rights to individual parcels may not be available. Creating a common property regime may be a way of instituting collective management rules - which function as imaginary fences and informal courts internal to the user group - to fill this gap. It is cheaper in these circumstances and it is within the power of a group of resource users to create (even if they cannot create a nationwide system of courts and cannot afford barbed wire). Common property regimes can be particularly attractive in providing administrative efficiency when resource management rules can simply be grafted on to the functions of a pre-existing community organization.
>
> (p. 5).

Poteete and Ostrom (2002:10) identify several variables that help to indicate likelihood of successful collective action:

Attributes of the Resource:

- Feasible improvement: The forest is not at a point of deterioration such that it is useless to organize or so underutilized that little advantage results from organizing.
- Indicators: Reliable and valid information about the general condition of the forest is available at reasonable costs.
- Predictability: The timing and location of resource units are relatively predictable.

- Spatial extent: The forest is sufficiently small, given the transportation and communication technology in use, that users can develop accurate knowledge of external boundaries and internal microenvironments.

Attributes of the Users:

- Salience: Users are dependent on the forest for a major portion of their livelihood or other variables of importance to them.
- Common understanding: Users have a shared image of the forest (in terms of the four resource attributes identified above) and how their actions affect each other and the resource. They can, in essence, make realistic predictions about likely future results of collective action of diverse types.
- Discount rate: Users have a sufficiently low discount rate in relation to future benefits to be achieved from the forest.
- Distribution of interests: Users with higher economic and political assets are similarly affected by a current pattern of use.
- Trust: Users trust each other to keep promises and relate to one another with reciprocity.
- Autonomy: Users are able to determine access and harvesting rules without external authorities countermanding them.
- Prior organizational experience: Users have learned at least minimal skills of organization through participation in other local associations or learning about the ways that neighboring groups have organized.

Poteete and Ostrom offer other more contentious indicators of successful collaboration:

- Group size and heterogeneity for common understanding, a favourable distribution of interests and trust: a small group and one with more homogenous social, cultural and economic characteristics or interests being more likely to lead to successful collective action.

Finally, the state must provide sufficient support if the approach is to be successful. Free riders and users outside of the common property membership will undermine the effectiveness of the approach if the state does not provide sufficient sanctions against abusers of the property rights (Grafton, 2000). The common property system does, however, rely on its members for monitoring and reporting of transgressions, thereby reducing the burden on government agencies to perform this function.

For NTFP resources in British Columbia, some of the resource attributes may be sufficiently, although perhaps not well understood; however, the user attributes are far more difficult to observe and document at each industry level. Many users depend on the harvest of NTFPs only as a supplement to regular income, while others are circuit harvesters with a higher dependence. Harvesters may share a fairly close vision of forest stewardship, yet harvesters have very high discount rates while buyers/exporters have somewhat lower rates. There is a general collaborative relationship among harvesters and a sharing of general information, although one's knowledge of favourite harvesting sites is closely guarded. At the buyer/exporter level, various degrees of distrust are present. There is however an informal organizational structure among the companies buying and shipping NTFPs that could indicate a far greater level of cooperation than what appears on the surface. Finally, the harvester-group, while perhaps the most homogenous, is very large, for some products numbering in the hundreds and thousands. The buyer/exporter level, however, is made up of relatively few participants, yet share perhaps the least amount of trust. This highly complex setting would suggest that a common property approach would likely fail; however, combined with some state-based prescriptions and means to overcome transaction costs, this combination may provide the best hope for effectively managing NTFPs to ensure a healthy environment and industry.

It should also be noted that private property can (and often does) exist within a common property regime, especially as noted earlier, for particularly valuable resources. It may be possible to allocate forest resources in a large forest to a group, with particular rights allocated to individuals. Some sort of "check off" system (on the individual rights holder) could be used to ensure investment in the resource stock and system by the group. Particularly where the group has not evolved to exhibit many of the characteristics noted above, very specific individual rights and obligations may be necessary to prevent free-riding within the group. Fisheries examples discussed briefly in section 4.3.1. exhibit this system of "individual extraction" and – to a limited degree - "common investment," where the individuals are all part of the group (and different therefore from individual extraction and common investment by the state).

4.3. Examples of the management CPRs and NTFPs in other jurisdictions.

The following examples are intended to provide practical background to the management of CPRs, but should in no way be considered an exhaustive review of the CPR literature. The first is a discussion of fisheries management in British Columbia and the second describes the management of NTFPs in the U.S. Pacific Northwest.

4.3.1. Examples from Fisheries Management

During the last quarter century, the trend in fisheries management internationally has been to a greater specification of property rights. Ocean fisheries have long been considered the classic example of common pool resources, for which state management has been an almost universal failure and for which specification of full private property rights is difficult or impossible. Many of the newer forms of fisheries management are hybrid systems in which the State (sometimes several nation states), harvesters (as a group) and individual harvesters each have specific rights and duties. In conjunction with more secure rights to fisheries resources, for example individual, group or community quotas, harvesters have generally been expected to assume more responsibility for management and research activities. In some cases, governments continue to carry out this work, funded by higher fees from resource users, but often groups of harvesters themselves, through associations or other arrangements, have taken on direct responsibility for catch monitoring, stock assessment, and other aspects of fisheries management.

In British Columbia, much of this trend toward more complete property rights in fisheries (although the term "property" is usually avoided) has occurred in either newer commercial fisheries, such as those for sea urchins, or in fisheries that have recently moved from an informal, part-time basis to fuller commercial utilization, such as the intertidal clam fishery. In other cases, quotas have been introduced in long-established fisheries, such as the halibut fishery. Physical, technical, economic and political criteria all have contributed to determining the specific management changes in each specific fishery, but some common themes emerge (Mitchell, 1994; Bickers and Williams, 2001; Fisheries and Oceans Canada, 2001). "Property rights" solutions to fisheries problems appear more successful where:

- the resource is comparatively immobile (shellfish or groundfish), i.e. more like terrestrial resources that remain in a fairly defined geographic area;
- the number of harvesters is comparatively small, or is organized geographically so that a relatively small number are linked with a relatively well-defined harvest area;
- stewardship (management and research) responsibilities are assumed by harvesters in tandem with the allocation of more secure property rights;
- opportunities and institutions for communal and other common property rights are available and supported where they are appropriate and desired.

The introduction of property rights – particularly in higher value fisheries for comparatively immobile species – has partially overcome several of the problems associated with common pool resources. Limiting the number of harvesters and assigning quotas (individual or communal) has helped reduce the dissipation of rents, reduce unnecessary capitalization, reduce problems such as fishing in dangerous conditions because of time-limited openings, and increase the market value of the catch. For example, individual quotas in the halibut fishery have resulted in a virtually year-round fishery with fresh halibut, which is much more valuable than frozen halibut, being available to the market.

Rents are now available to support activities such as monitoring and validation, research, and enforcement which are funded in whole or in part by the fishery itself, rather than from general tax revenues. In a few instances, rents have been applied to the enhancement of the stocks themselves, such as "re-seeding" juvenile geoduck clams in oveharvested areas.

In fisheries management, property rights have been less successful in avoiding problems such as bycatch (incidental catch of non-target species) and in encouraging investment by harvesters in both stock-specific and more general approaches (e.g. habitat improvement) to sustaining the resource and the resource system. In these cases, the benefits of investment are not well matched with the costs, or the costs of poor harvesting practices are imposed on other stocks or systems which are not of direct concern to the group engaging in these practices.

It is perhaps notable that the salmon fishery has been impermeable to these types of arrangements, apparently due to such factors as long-established interests and extreme cultural and economic significance of the resource to coastal groups, particularly First Nations; legal status of First Nations rights; competition among sports, subsistence and commercial harvesters; mobility of the resource (including migration through international waters); vulnerability to a wide variety of threats (terrestrial and marine); and numerous other factors.

The experience of fisheries management has direct application to NTFP management. Greater specification of property rights has generally improved stewardship of resources, but licensing on a "species by species" basis has not been successful in conserving non-target resources or in promoting investment in the resource system itself. Where the rights and responsibilities of harvesters have been defined simultaneously, it has been easier to introduce concepts and practices of harvester responsibility for administration research and enforcement. Where possible, resource management institutions should be introduced *before* there is significant commercial exploitation of a resource; once interest is established, reform is much more difficult.

4.3.2. The U.S. Pacific Northwest Experience

Overview

Researchers and land managers in British Columbia with an interest in non-timber forest products often look to the US Pacific Northwest States of Oregon and Washington for industry information and insight into the management of these understory resources. Both private and public land owners in the Pacific Northwest have managed in one way or another the harvest of a variety of non-timber forest products, in some cases successfully and others not so successfully. The following section attempts to tell their management story. From this we can glean numerous lessons and guidance in the development of a management regime for NTFPs in British Columbia. Agencies in the U.S. generally include NTFPs within Special Forest Products (SFPs) for legislative and management purposes, and so this term will be used throughout this section. SFPs also include products such as shake and shingles, firewood, poles and other more timber related products.

The most significant feature in the Pacific Northwest is the mix of State, Federal and private landowners.[46] In Washington State the total land base is 45.2 million acres (18.3 million hectares). About 53.5% of the State's land base is privately held, with the remainder split among various government levels and First Nations. National Forests account for 21.1% of the State's total land base, National Parks and other Federal lands account for 8.7%, Washington State Department of Natural Resources (DNR) and other State agencies account for 8.6%, First Nations account for 6.2% and the remainder, 1.9%, is made up of counties, cities and other local areas.

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[46] For comparison, statistics of the land base in British Columbia are in Section 2.2.

The Washington State Department of Natural Resources (DNR) manages the majority of State owned public land (5.6 million acres or 2.3 million hectares), which consists of granted trust lands and other state lands. Trust lands are designated to provide funds for specific public entities, such as public schools, universities, and other institutions. State held public land, however, is not concentrated in one or even several areas. DNR administered lands are divided into hundreds of small parcels throughout Washington State, each of which provide funds for specific public requirements. Some rationalization of this patchwork has occurred, notably in the western portion of the State, but many small parcels still exist in the east.

Oregon has a total landbase of about 62 million acres (25.1 million hectares), about 27.5 million acres (11.1 million hectares) of which are forest land. More than half of Oregon's forest land (60.5 percent) is publicly owned: the federal government manages 56.8 percent while state and local governments hold 3.7 percent. Of the 39.5 percent of forest land that is privately held, 21.5 percent is owned by large, corporate landowners, and 18 percent by family forest and tribal owners.

The Oregon Department of Forestry manages about 789,000 acres (319,500 hectares) of forest land, the majority of which is within five state forests, further divided into 13 forest districts. Similar to Washington State, some of Oregon State forests are trust lands and provide revenue for such things as public schools.

The United States Department of Agriculture, US Forest Service accounts for the majority of forest land under federal management: 20.1 million acres (8.1 million hectares), or 19% of the total land base of Oregon and Washington. The Forest Service manages 19 National Forests and other special use, recreation and wilderness areas. Each National Forest is administered individually.

The Department of Interior, Bureau of Land Management (BLM), is the other federal agency managing federal lands in Washington and Oregon. The BLM manages a total of 16.6 million acres (6.7 million hectares) in the Pacific Northwest, the majority of which (98%) are in Oregon.

Private lands comprise a large portion of the Pacific Northwest land base, but while they are considered as one category of landowner they are by no means a cohesive unit. Different landowners deal with SFPs in different ways. Some of the largest private landowners of forested land are Weyerhaeuser, Simpson Timber Company, Plum Creek Timber. While a small number of large companies may have the majority of private land, there are however, a large number of small landowners who account for about 25% of the private land and who also provide access to their lands for SFP harvesting or take part in the SFP industry themselves.

Management of SFPs in the Pacific Northwest

While the industry has existed in some form for several decades, the majority of management efforts come into existence in the 1980s-1990s and is an ongoing process. Washington State, for example, has had brush leases since the 1950s and the brush industry was a source of income for many people during the depression (Mark Savage, Washington State DNR pers. comm.).

The number of State and Federal management districts, and various private landowners creates the potential for an equal number of management regimes. Each private landowner has the right to allow or deny access to its lands and develop its own rules for managing or selling SFPs. Each state and federal agency has its own mandate to provide management and stewardship of the resources, but generally follow more centralized management guidelines, although there is some discretion at the land manager level. *The management of SFP resources, however, is mainly focused on people management efforts rather than resource management efforts.* For example, agencies provide authority for people to harvest legally, but do not require intensive growth and management activities, such as with intensive silvicultural efforts for the growth and yield of timber. The exceptions to this include the harvest of boughs and cascara bark where resource management efforts have included limits to volumes harvested and harvesting techniques. This has also occurred in British Columbia, although t a lesser extent, when the timber resource may in some way have been threatened, as with cascara, western yew and some bough harvesting.

While the myriad of alternate approaches may seem burdensome with potentially unfair regional differences, the discretion allows each district to adapt its management approach to specific regional circumstances. This is an important distinction to remember in the design of an appropriate system for British Columbia. The following discussion provides a more detailed description of each State and Federal agency and for one private landowner.

Washington State

Washington State manages the harvest of SFPs (termed "special forest products" in Washington State statutes) on State lands through the Department of Natural Resources. However, State transportation laws regulate the movement of SFP resources thereby creating the need for all landowners, State, federal and private, who wish to allow the harvest of SFPs from their lands, to provide permits to commercial harvesters. The original intent of this law was to limit theft from any lands, be they private state or federal, and not necessarily as a tool to manage the harvest and shipment of SFPs. However, the law provides an essential component of managing the SFP industry, that being the ability, at least in theory, to be able to track where produce is harvested from and in what volume. As Section 76.48.060, Chapter 76.48, Title 76 of the Revised Code of Washington (RCW) states:

> A specialised forest products permit validated by the county sheriff shall be obtained by a person prior to harvesting from any lands, including his or her own, more than five Christmas trees, more than five native ornamental trees or shrubs, more than five pounds of cut or picked evergreen foliage, any cedar products, cedar salvage, processed cedar products, or more than five pounds of Cascara bark, or more than three United States gallons of a single species of wild edible mushroom and more than an aggregate total of nine United States gallons of wild edible mushrooms, plus one wild edible mushroom.

The permit must include the following information and must be available for inspection at any time by county and state police:

> (1) The date of its execution and expiration;
> (2) The name, address, telephone number, if any, and signature of the permittor;
> (3) The name, address, telephone number, if any, and signature of the permittee;
> (4) The type of specialized forest products to be harvested or transported;
> (5) The approximate amount or volume of specialized forest products to be harvested or transported;
> (6) The legal description of the property from which the specialized forest products are to be harvested or transported, including the name of the county, or the state or province if outside the state of Washington;
> (7) A description by local landmarks of where the harvesting is to occur, or from where the specialized forest products are to be transported;
> (8) The number from some type of valid picture identification; and
> (9) Any other condition or limitation which the permittor may specify.

In regards to the transport of special forest products, Section 76.48.070 states,

> …it is unlawful for any person (a) to possess, (b) to transport, or (c) to possess and transport within the state of Washington, subject to any other conditions or limitations specified in the specialized forest products permit by the permittor, more than five Christmas trees, more than five native ornamental trees or shrubs, more than five pounds of cut or picked evergreen foliage, any processed cedar products, or more than five pounds of Cascara bark, or more than three gallons of a single species of wild edible mushrooms and more than an aggregate total of nine gallons of wild edible mushrooms, plus one wild edible mushroom without having in his or her possession a written authorization, sales invoice, bill of lading, or

> specialized forest products permit or a true copy thereof evidencing his or her title to or authority to have possession of specialized forest products being so possessed or transported.
>
> RCW 76.48.070

Buyers of special forest products are also targeted in the legislation and are required to record transactions.

> Buyers who purchase specialized forest products are required to record (1) the permit number; (2) the type of forest product purchased; (3) the permit holder's name; and (4) the amount of forest product purchased. The buyer shall keep a record of this information for a period of one year from the date of purchase and make the records available for inspection by authorized enforcement officials. The buyer of specialized forest products must record the license plate number of the vehicle transporting the forest products on the bill of sale, as well as the seller's permit number on the bill of sale.
>
> RCW 76.48.085

Agencies responsible for enforcement are also established within the statutes:

> Agencies charged with the enforcement of this chapter shall include, but not be limited to, the Washington state patrol, county sheriffs and their deputies, county or municipal police forces, authorized personnel of the United States forest service, and authorized personnel of the departments of natural resources and fish and wildlife. Primary enforcement responsibility lies in the county sheriffs and their deputies. The legislature encourages county sheriffs' offices to enter into interlocal agreements with these other agencies in order to receive additional assistance with their enforcement responsibilities.
>
> RCW 76.48.040

The legislation governing special forest products applies to all lands within the State and attempts to manage and monitor activity at the harvesting, transportation, and buying levels of the special forest product market. State laws also extend to SFPs shipped from other states and provinces of Canada,

> It is unlawful for any person to transport or cause to be transported into this state from any other state or province specialized forest products, except those harvested from that person's own property, without: (a) first acquiring and having readily available for inspection a document indicating the true origin of the specialized forest products as being outside the state, or (b) without acquiring a specialized forest products permit as provided in subsection (4) of this section.
>
> RCW 76.48.075

The stewardship and authority over resources is the responsibility of the landowner while the product remains on the land; however, once the product is transported off the land, jurisdiction over the products transfers to the State. Thus, for agencies such as the US Forest Service or BLM, management regimes for SFPs are generally focused at the harvester level. Given the high number of potential landowners in any particular area, once the product is transported off the land, knowing whose land the product originates from is problematic, regardless of the stated landowner on the permit. Straying from land identified on one's permit to other land is not uncommon, and is generally referred to as trespass and taking product is considered theft.

Washington State Department of Natural Resources.

As stated previously, the DNR manages a range of land and water resources that are a "checkerboard" of parcels throughout the state. The Washington State DNR is attempting to provide better resource management for SFPs, in addition to managing the human resource issues. This is evident by its brush lease requirements and its efforts to develop a Noble fir bough industry, as discussed below.

Guidelines for harvesting SFPs on DNR land vary by time of year and species, but the commercial harvest of any species requires a permit. The DNR also issues exclusive area-based leases for products such as salal and brush for terms ranging up to 10-years; these lessees must in turn issue permits to harvesters. One problem identified with per acre leases, however, is that actual volumes harvested are not recorded. To overcome this reporting problem, in 2002 the State is planning to offer some leases on a percent bid basis, which would accept offers on a percentage of the total value taken from the area, thus reflecting the volume shipped. For products such as edible wild mushrooms, however, area based leases are not useful, unless covering a wide area, and are generally not sold.

Permit rates vary by product, but in general the goal is to achieve a return to government of 10% of the value of the resource at the harvester level, or first-point-of-sale. Payments for area leases are based on a rate of approximately US$4 – 10 per acre; however, recent brush auctions have indicated that much higher values may be obtained from high quality sites. Six sites were auctioned in February 2002 with the average final bid being over US$10 per acre and the highest being US$16.39. The new leases require daily recording of species harvested and quantities and must be submitted to the DNR on a monthly basis.

Other types of harvest authorization include one-year non-exclusive permits by area for an unlimited volume of salal, or other brush products currently range from $300 to $400 per year. The cost for edible wild mushroom permits range from $75 to $100 depending on the area. Annual revenue from SFPs on State lands is approximately $400,000 with projections for 2002 of $600,000. The permitting system is based on a pre-harvest estimates, not post-harvest accounting of volumes and does not capture trespass or theft volumes, subsequently, this total revenue may well be below 10% of the total value to harvesters. The State is actively looking at ways to increase their revenue from SFPs, including brush sales and the development of a noble fir bough industry.

The Christmas bough market is one of the more lucrative markets for SFPs and Noble fir is likely the most valuable of all bough species. The Washington State DNR actively markets boughs, including the most lucrative Noble fir bough. In 2001, the DNR made approximately US$240,000 on all bough sales and is attempting to increase this by another US$100,000. Washington State DNR is pursuing the development of Noble fir plantations for the bough industry using species and technology from Denmark. Denmark has a well-developed industry with Noble fir plantations and is one of the leading suppliers of Noble fir boughs to the European market. In 1994, revenue generated by the Noble fir industry was about US$70 million, about one-third the national revenue from all forest product sales (Mark Savage, DNR, pers. comm). The success of the Danish Noble fir bough industry has been attributed to its commitment to research and development, and marketing. About US$8 million are spent annually on marketing (45%), research (40%), technological developments (10%), and environmental investments and education (5%).

The most serious issues currently faced by landowners is trespass, theft and labour laws, but added to this must be the potential overharvesting of some species. The ability to enforce State laws that govern SFPs is limited, given available funds and human resources at the state and county levels. Further, penalties for those caught transgressing State SFP laws have also been minor, making the cost of being caught in most cases below the potential benefits from cheating the system. Having a land ownership system characterized by multiple landowners with adjacent land holdings not only leads to unintended trespass, but also to intentional trespass and theft of resources. Finally, labour laws and liability have become a major concern throughout the Pacific Northwest. SFP companies, government agencies, and private landowners are currently debating whether or not SFP harvesters are employees of SFP buyers, or are self-employed. Concerns include not only liability for landowners, but also workers compensation, federal and state tax and other employee deductions, health and worker rights.

When asked about the design of a management system for NTFPs in British Columbia, Mark Savage (pers. Comm.), Special Forest Products Forester for the DNR, suggested the following:

- use of negotiated sales for area or longer term leases;
- broader agreements covering a range of products;
- providing more authority to land managers;
- managers must understand the market, not only in terms of prices, supply and demand, but also by becoming active participating in projects on the ground; and
- less administration from the top.

Oregon State

Similar to Washington State, Oregon also has legislation addressing the harvest and transport of SFPs. Oregon manages State forestry lands through the Department of Forestry. As in Washington State, Oregon's laws also extend to federal and private land, although there are some differences, as noted below.

In terms of requiring permits for harvesting SFPs, the Oregon Revised Statutes state that:

> It is unlawful for any person to cut or split wood into special forest products or to harvest or remove special forest products from a place unless the person has in possession a written permit to do so from the owner of the land from which the wood is cut or the products taken. The written permit required under this subsection must set forth:
>
> (a) The date of the permit;
> (b) The name, address, telephone number and signature of the person granting the permit;
> (c) The name, address and telephone number of the person to whom the permit is granted;
> (d) The amount and kind of wood, by species, to be cut or split or the amount and kind of special forest products to be taken;
> (e) A description of the premises from which the wood is to be cut or the products taken. The description may be by legal description, tax account number or other description clearly identifying the premises; and
> (f) The date of expiration of the permit.
>
> Section 1. Sub-section (1)
> ORS 164.813

Oregon also regulates the transport of special forest products:

> It is unlawful for a person to transport special forest products without possessing a permit as described in subsection (1) of this section or a document of sale showing title thereto. A document of sale must be signed by the landowner, seller or donor, and must set forth:
>
> (a) The date of the document;
> (b) The name, address and telephone number of the seller or donor of the products;
> (c) The name, address and telephone number of the purchaser or donee;
> (d) The amount and kind of products sold, by species; and
> (e) A description of the premises from which the special forest products were taken. The description may be by legal description,

> tax account number or other description clearly identifying the premises, or by street address in the event of purchase from a woodlot or fuel dealer or dealer in other special forest products.
>
> Section 2. Sub-section (2)
> ORS 164.813

Unlike Washington State, however, Oregon does not require private landowners to report the harvest and transport of special forest products which the landowners harvest themselves. Subsections 3 and 5 of the Oregon Statutes states that:

> Any person who engages in the purchase or other acquisition of special forest products for resale, other than special forest products acquired from property owned by that person, shall keep records of such purchases or acquisitions for a period of one year from the date of purchase or acquisition.
>
> Section 3. Sub-section (3)
> ORS 164.813

> Subsections (1) and (2) of this section do not apply to: … (e) The cutting or transportation of special forest products by the owner of the land from which they were taken or by the owner's agent; (f) The transportation of special forest products by a common carrier or contract carrier.
>
> Section 5. Sub-section (5)
> ORS 164.813

As with Washington State, Oregon State has laws regulating the management of all resources within the State, and also directly manages State owned land for resource exploitation, conservation and recreation through the Oregon State Department of Forestry. Each of the State's 13 Forest Districts has the discretion to manage non-timber forest products as conditions warrant. Non-timber forest products appear to be managed more to meet public demand and associated State legal requirements for access to State forest lands, than as a source of revenue.

For example, the Oregon Department of Forestry's Coos District manages the Elliot State Forest located near Coos Bay Oregon. The State forest covers approximately 93,000 acres (37,665 hectares) in the Oregon Coast Range. The purpose of the special forest products program at the Coos District is to "respond to public enquiries and demands for these products with an expected target recovery of 10% of the end product value" (mimeo, Randy Lau, Coos Bay District). The 10% revenue target is not law. Permits allow the public to meet State transportation laws and are mainly sold for salal, huckleberry and sword fern. Permits provide exclusive area based rights and are priced at $30.00 per half section (320 acres) and are valid for one year and a day. No charges based on per unit harvested are used, which eliminates the need for tags or labels, and inspections, subsequently reducing program costs.

To obtain a permit, interested members of the public are required to identify specific areas, which the district then maps and checks for potential overlapping permit areas. Because the District requires all permitted areas to be identified and mapped, the public does not generally seek permits for mushrooms. Trespass and theft likely occurs, but the remoteness of the forest and roughness of terrain limit this problem (R. Lau, Coos Bay District, pers. comm.).

The permit system used by the Coos Bay District simplifies potentially onerous district management requirements. The District does not undertake inventories, identify high value areas or concern itself with volumes harvested and monitoring. Unfortunately, as a result the district likely does not meet its goal of collecting 10% of the product value. An average of 25 leases per year provides the State with total revenues of up to $750 per year. If $750 were 10% of the total value at the first point of sale, the product would be worth about $7,500, or $300 per permitted area. A return of $300 would certainly not be a sufficient inducement to identify the area and harvest, or hire personnel to harvest, the products. It is likely that permitees earn far more revenue and the district is not recouping 10% of the value of the resource.

United States Forest Service

The U.S. Forest Service manages Special Forest Products in Washington and Oregon. The Forest Service issues permits and contracts to harvest SFPs, guided by the Regional and National headquarters through the Forest Service Manual (USFS Forest Service Manual, 1996). There are four types of use defined by the Forest Service: commercial, personal, free use, and Native American. Permits are required for all uses, with some exceptions for free use in which small incidental amounts may be harvested. Contracts are generally used for greenery products such as boughs. On average, the forest service receives about $2 million per year for the harvest of SFPs in Oregon and Washington States (Frank Duran, USDA Forest Service, pers. comm).

Minimum rates for SFPs are also included in the Forest Service Manual. Actual rates charged however, can vary and "where significant variations in conditions and markets exist, forests may establish rates on a per unit or zone basis" (USFS Forest Service Manual, 1996). More specifically, for SFPs, which are included in the designations of nonconvertible timber products or nonconvertible non-timber products, the standard rates should be established by the Forest Supervisor. In the absence of an appraisal, the standard rate may be established at 10 to 15 percent of the wholesale or shed value. Permit durations are also established at the forest level. The following table provides the current minimum rates for a selection of products:

Table 2: Minimum rates for non-timber forest products, US Forest Service.

Forest Product	Minimum Rate ($)	Unit of Measure
Boughs		
Noble fir and other sp.	20.00	Ton
Western red cedar	0.01	Pound
Transplants		
Tress < 1 foot tall	0.20	Each
Trees 1 – 4 feet tall	1.00	Each
Trees over 4 feet tall	2.00	Each
Live shrubs and plants	0.50	Each
Sword Fern	0.05	Pound
Salal		
Tips	0.05	Pound
Longs		
Oregon Grape	0.05	Pound
Bear Grass	0.05	Pound
Huckleberry foliage		
Tips	0.05	Pound
Longs		
Moss	0.05	Pound
Medicinal products		
Prince's Pine, Oregon Grape root, Quinine Conk	0.05	Pound
Edible wild mushrooms		
N.A. Matsutake	1.00	Pound
Other species	0.20	Pound

Source: USFS Forest Service Manual, Portland Oregon, Title 2400 – Timber Management, R6 Supplement No. 2400-96-2. Effective September 12, 1996.

The Forest Service has developed and implemented as of September 2001, an SFP pricing or appraisal model that provides the capability to set permit prices for a variety of SFP resources. As with other agencies, the objective of the system is to obtain 10-15% of the first-point-of-sale price. The pricing system accounts for harvesting costs, including travel and labour costs, and uses current market prices as an indication of value.

Forest districts do have the discretion to adapt their management regimes somewhat to local conditions. For example, in the Oregon Dunes National Recreation Area within the Suislaw National Forest, the forest service has developed a unique bid system to sell North American Matsutake harvesting permits. Due to a large increase in mushroom harvesting and potential damage to the Dunes area, the Forest Service was required to undertake an environmental assessment of mushroom harvesting (USFS, 1993). The result of the process was a limited offering of 100 permits based originally on a lottery type system, but which has since evolved into a sealed bid award system. Permits currently have an upset price of $325 and have generally received bonus bids of $10 to $25. Regardless of this system and the fairly close scrutiny of permitted harvesters and Forest Service enforcement agents, theft continues to be a problem and as many as 200 illegal pickers continue to access the Dunes.

In the Suislaw National Forest, commercial harvesters of edible wild mushrooms other than Matsutake are changed $2.00 per day for a five day to a maximum of 25-day permit for an unlimited quantity. A one-year permit costs $100, for the period March 1st through February 28th.

In another example, the Willamette, Winema, Umpqua, and Deschutes National Forests have combined efforts to provide management and harvesting guidance for the harvest of North American Matsutake. Districts sell permits for commercial harvesting and, among other things, provide maps of authorized and restricted harvesting areas. The Crescent Lake and Chemult Ranger Districts have been cooperating in the management of the North American Matsutake since 1989, and have developed a very successful permit system with a 90+% compliance rate (Pilz et al., 1999). Permits are issued for 5-days at $50, 30-days at $100, and a full season permit (a variable time frame depending on the growing season) at $200 (G. Smith, USFS pers. com.) All permits are valid in the four National Forests.

The districts are divided into seven harvest areas, any of which can be closed to avoid ecological damage if too many harvesters concentrate in any one area. However, keeping all areas open generally spreads out the pickers and reduces any potential ecosystem damage. Some closures have resulted from harvesters raking the soil in search of the elusive mushrooms. These areas take about four years to recover. The Districts also use harvest opening-dates for North American Matsutake, currently fixed at the first Tuesday after Labour Day. A moveable opening date is currently being considered by Forest Service staff to suit changing conditions.

While the Forest Service charges fees to harvest North American Matsutake and sets some stringent management conditions, it also provides benefits to the pickers.[47] In the Chemult Forest District, camping locations have been established for the harvesters, which provide fresh water, toilets, and garbage bins at a cost to campers of $3 per person per day. The forest service has established two camps which become temporary communities complete with stores and restaurants: Little Odel Industrial camp with a capacity of 1000 campers and Chemult North Industrial Camp with a capacity of 500 campers. Harvesters are not allowed to use regular forest service campsites. Each camp has a concessionaire who manages the campground. Contracts to manage the camps are put out to tender and can be for a term of up to five years. Concessionaires pay the forest service a percentage of the revenue it earns. The forest service maintains a presence in the camps and has meetings involving not only the forest service, but also local and state social agencies.

The high compliance rate and other successes in the Chemult district are the result of the efforts of district personnel. Chemult district has an interpreter on staff to deal with Laotian, Thai, Cambodian, and Vietnamese, who form the majority of the picker population and the office takes an active role in providing pickers with information about harvesting methods and woods safety. The Chemult district has a video that prospective pickers must view prior to obtaining a permit. The forest service office has taken the management view that they must deal effectively and fairly with the picking public and has found that providing these benefits, while being a cost to the forest service, has also reduced enforcement and clean-up costs (G. Smith, pers. com.).

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[47] An alternative view of these "benefits" is presented below in the Section "Is any management good management?"

With minor exceptions, the Forest Service does not require mushroom buyers to obtain permits. Buying stations generally congregate around small communities and are minimally managed by the State and county levels of government. The exception is in the Sisters Ranger District where the buying stations are located on Forest Service land. The county requires each buyer, or shed, to obtain a "transient buyers permit" and the State requires buyers to record transactions. Unfortunately, little is done with the data, but must be available if police ask to see it.

Bureau of Land Management

The BLM, similar to the U.S. Forest Service, considers all forest resources with commercial value as an important management consideration and source of revenue. The BLM manages SFPs in the same manner that they manage and sell special forest products, such as Christmas trees, shake and shingle bolts, and firewood. Legislation drives the management and sale of SFPs, as provided in the Federal Land Policy and Management Act (1976).

The BLM uses contracts for the sale of all special forest products, including SFPs. The BLM has developed a SFP procedures series handbook which states that "products shall be sold at the highest value to the government at all times. Each District Manager shall establish a minimum price list for the SFPs sold in their district. The district price for any given SFP is to reflect the *in situ* (preharvested) fair market value of the product or 10% of the wholesale fair market value, whichever is higher … If comparable sales information does not exist, the fair market value prices shall be calculated using the analytical appraisal method" (pp. VI-3H-5400-2, Special Forest Products Procedures Series Handbook). Contracts specify the product, area, quantity, duration and price. It is the discretion of the Resource Area's Field Manager whether or not a contract provides exclusive rights to an area.

In 2001, the BLM sold 5,600 contracts in Oregon for a total value of $161,000 (J. Gordon, SFP Coordinator, BLM, Salem OR). The most contracts sold by product were for Christmas trees and mushrooms, but the highest quantities and values were for coniferous boughs and floral greenery such as salal. Prices for special forest products including SFPs are determined with a computer based appraisal system, which determines a per unit price taking into consideration current prices and specific product related costs. The minimum amount for each transaction is $10 for all special forest products on BLM lands and in 2001 the average price per contract was $28.65 (BLM, 2001). The use of the SFP procedures series handbook and the appraisal system provides an opportunity to ensure that SFPs in all BLM districts are priced consistently. Regardless of the system in place on BLM lands, it is still difficult to monitor and enforce compliance. It is estimated that the volume or SFP harvested is up to 50% higher than is permitted (pers. comm. J. Gordon, SFP Coordinator, BLM, Salem OR).

The BLM's Coos Bay District is located on Oregon's south-central coast and covers an area of 325,000 acres (131,625 hectares). The District has been issuing contracts for the harvest of SFPs since 1976. SFPs of commercial interest in this District include salal, beachgrass, sword fern, red and blue huckleberry, cascara and edible wild mushrooms. In fiscal 2001, the District issued 1,267 contracts for a variety SFPs, the total value of which was about $17,400. This is close to half the value of all products sold from the district, including all wood products.

A two-day mushroom contract is sold for $10, based on 10-cents per pound and the assumption that pickers can harvest 45 pounds per day ($9 reflects the volume and $1 is charged for road maintenance). A 3-month permit costs $100 ($90 for the resource and $10 for road maintenance). Other significant SFPs sold include floral greenery and Christmas trees.

SFPs are managed essentially as a public service in the Coos District by providing the public with the required contracts to meet State harvesting and transportation requirements. Contracts are only issued on Wednesdays, nonetheless, the costs associated with the contract system are high and revenues likely do not cover related costs. The Coos District office in North Bend is also the only issuing office for SFP contracts, and given the dispersed land area of the Coos District, some areas of which are 200 miles from North Bend, there is likely theft of resources occurring and the District is not recouping the full value of the resource (J. Menton. BLM Coos Bay District pers. comm.). Further, given the method of selling contracts based on volume prior to the harvest, as with other areas in the Pacific Northwest, there is a strong likelihood that SFP harvesters take a greater volume than is issued under contract, especially with longer term contracts.

The BLM has attempted some longer term sales for area based harvest of SFPs. Contracts have been offered for sale for areas of past timber harvesting or where planned harvesting is scheduled. There has been limited interest in this type of sale, however, possibly due to the difficulty of providing exclusive rights to the area and the uncertainty associated with species productivity and markets.

Private lands

As stated previously, private landowners deal with SFPs differently, ranging from allowing access to their lands to closing their lands to any outside users.

Simpson Timber Co. for example owns and operates on 300,000 acres (121,500 hectares) of land in the Mason and Grays Harbour area of Washington State. Simpson Timber charges $2.50 per acre for brush leases with the same companies returning each year (Craig Marbet, Simpson Timber, pers.comm). Challenges facing Simpson Timber include the costs associated with administering the lease or permit program, and trespass and theft. The company actually pays part of the salary of a local law enforcement officer to assist in enforcement activities on Simpson Timber lands. Other concerns include liability towards harvesters working under the lease.

Evident is that private landowners share similar problems with state and federal agencies. Because the industry is not managed through production levels from harvest to distribution, the ability of a landowner to effectively deal with labour, theft and other problems while trying to get a fair and full value for their resources is compromised.

Is Any Management Good Management?

Resource management efforts are based on current ideological or philosophical tenets of land use, stewardship and efficiency. In the U.S., the reasons for managing the harvest of edible wild mushroom, and SFPs in general "coincide with a shift in the management paradigm that shapes management priorities of the U.S. Forest Service and the Bureau of Land Management … both agencies have adopted ecosystem management as a guiding principle … this change … requires more resources to understanding and appropriately managing the extraction of NTFP resources from public lands" (McLain and Jones, 2001, p. 149).

This change in resource management ideology shifted the Forest Service from according edible wild mushrooms "little importance relative to timber, recreation, water quality protection and other forest management issues" (McLain, 2000, p.197). The Forest Service is guided by federal statutes that direct it to issue permits for the commercial harvest of any product from national forests. Any removal of a product with commercial value without a permit is considered theft. Enforcement of the Wilderness Act and the Northwest Forest Plan's protection of late successional reserves also requires appropriate monitoring and enforcement, which the permit system affords.

Rebecca McLain (2000) examined from a political ecology perspective the role and efficacy of a U.S. Forest Service management regime for North American Matsuake in central Oregon. Efforts to manage Matsutake in national forests of central Oregon have resulted from a large increase in interest in the resource as a source of income and its shift from an economically unimportant product, to an economically important product. The increase in the number of people who wanted access to the resource also raised concerns among Forest Service employees regarding potential ecological damage from harvesting practices such as raking and other potential impacts to the fungi, to camp related garbage and waste issues (McLain, 2000).

McLain (2000: p. 195) characterises the Forest Service's management of the wild mushroom industry as based on the following "disciplinary power techniques:"

- categorization of wild mushroom pickers and buyers into several distinct groups;
- separation and enclosure of commercial pickers and buyers from other forest users;

- establishment of a documenting apparatus for keeping track of pickers and buyers;
- efforts to professionalize wild mushroom knowledge and activities; and

- construction of a panopticon surveillance system to facilitate monitoring and enforcement of wild mushroom regulations.

Management efforts in the U.S. Pacific Northwest reflect a state-based conventional regulatory coordinating mechanism. The use of techniques of "disciplinary power" can be viewed as a blueprint for an effective state control regime, yet one that tends to lack any appreciation or consideration of the heterogeneity of the SFP industry. Does state *de jure* attempts to control in such a manner one sector, as a result of real or perceived impacts to the ecosystem and local communities, achieve management objectives in the most effective, efficient, and equitable manner? What are the alternatives to managing SFPs on state lands to achieve stated national or regional objectives?

McLain's research resulted in several conclusions, or lessons for forest managers, that are helpful in the development of a management regime in British Columbia:

1. **The role of public participation**: forest managers must re-conceptualise the way in which the public participates in resource decision making, and conversely that mushroom pickers and buyers can participate in management without compromising their values.
2. **Local versus regional policy**: management regimes should not necessarily favour rigid policies that cover a wide geographic range. Smaller regional or local flexibility in managing the variety of products over the landscape are necessary to ensure an efficient and equitable regime for managers, pickers and buyers.
3. **Local management presence**: it is important that the people involved in the management of the resource have local field experience. Regional managers should incorporate the knowledge and expertise of these field personnel into their decision-making process.
4. **Industry involvement**: while the industry tends to value its secretive and invisible nature, potential policy changes could have significant implications in terms of access. If the industry is to have any strategic influence it will need to accept that its "invisibility" has become, or is becoming illusory.

Summary: the PNW's institutional approach to NTFPs.

Separate management responsibilities and the multiple number of landowners does create a somewhat disjointed management structure: once the resource leaves the landowner's area, the landowner no longer has any management requirements or rights. Thus, management of the industry predominantly remains at the picker level, with buyers paying little of no rent for the resources from which they benefit.

The institutional approach of resource agencies in the U.S. Pacific Northwest generally follows a state-based conventional regulatory system. Legislation and regulations guide the agencies in their reasons and ways of managing. This is understandable, however, given not only the more fragmented levels of land ownership, but also the more fragmented jurisdiction over the NTFP industry, versus NTFP resource users, which is the focus of much of the agencies' attention. While the States of Washington and Oregon do place requirements on the movement of product, managing the industry, from resource extraction to final demand user or point of export, does not occur. There is also little coordination between agencies and no central agency to formalize the collection and administration of the harvest and revenue data. As such, there is little understanding of the State or PNW region wide industry contribution to the economy. This is not a function of bad management or neglect, but reflects the institutional structure, rights and responsibilities of the resource governing agencies. In any case the U.S. Pacific Northwest is far ahead of British Columbia in their efforts to responsibly manage the resource and in their appreciation of the industry in general.

Common features of the management regimes in the Pacific Northwest include the following:

- For florals, greenery product and transplants, property rights have been provided through generally, but not always non-exclusive area-based permits, leases or contracts.
- For edible wild mushrooms, the right to access an area for harvesting is provided through time limited access permits.
- Permits fees are based on pre-harvest assumptions of volumes.
- The revenue objectives for all products generally range from 10-15% of wholesale value or first point of sale.
- All landowners that sell or authorize the commercial harvest of SFPs are subject to harvester permitting requirements, driven by state SFP transportation laws.

The challenges that continue to face resource managers despite state and federal laws include the following:

- multiple management areas or landowners with different management systems and goals and expectations;
- monitoring of volumes harvested and enforcement of limited access rights;
- labour laws dealing with employee/employer relationships and related workers compensation and liability;
- trespass and theft of product from unpermitted areas.

The following lessons learned are from several contacts in the U.S. Pacific Northwest and others were gleaned from personal observations:

- Provide benefits to pickers and buyers if charging fees.
- Be fair.

- Play an active role in the management of the resource.
- Manage the industry as a whole, not a specific level.
- Allow flexibility in system to address variety of local conditions and products.
- Area based or volume based permitting or tenuring systems not appropriate for all species.
- Pre-set harvest fees can deter compliance as volumes and related earnings can be unpredictable.
- Cost of issuing permits to pickers is high.
- A commitment from government.
- Provide NTFP industry with access to decision making.
- Use adaptive management principles in ongoing development of management system.

4.4. Summary: from status quo to management.

How do the pieces from Sections 2-4 fit together and inform us of an appropriate direction for the management of NTFPs? The design of an effective system of property rights requires that,

1) we have an adequate understanding of the biophysical and human systems, which are to be "connected" through our proposed management systems and that
2) an institutional response is both adequate to deal with these systems and that change is supported by not only the landowner, but also by other stakeholders.

NTFPs are a collection of common pool resources that are likely to offer the following management challenges:

- a difficulty in limiting access;
- high costs associated with monitoring and enforcement;
- a high discount rate among harvesters;
- a disincentive to provide or invest in the CPR resource;
- an uncertain and highly complex organization of resource users;
- a lack of biological, economic and social information about the resource and its structure;
- high potential for opportunistic behaviour and free riders.

The appropriate methods or institutional approach to managing the resource and overcoming these challenges is informed by characteristics of the resource. The ecological, economic and social characteristics of NTFPs presented in Section 2 and in greater detail in Appendix 1 are summarized using the following or themes:

1. First Nations have unique concerns regarding non-timber resources that include not only access to and availability of the resources, but also the traditional knowledge of its use.
2. Biological heterogeneity
   Significant diversity of species harvested, annual productivity, temporal and spatial variability, and ecological impacts related to harvest volumes and techniques.
3. Economic heterogeneity
   Significant diversity and variability of product values, market supply and demand, labour force, and harvester and buyer discount rates.
4. Social heterogeneity
   Significant diversity within and among commercial, subsistence, and traditional user groups, diversity of interests and shared norms.
5. Institutional homogeneity reflecting lack of sector transparency and formal management regime.
6. Lack of information for most product categories on volumes available and harvested, productivity, value, employment and local impacts.
7. Both competing and complimentary relationships between NTFP product and timber harvesting.
8. No property rights assigned, except for small areas designated under community forest tenures. Regulatory tools do not exist to easily establish a management regime, or ensure exclusivity, for the wide variety of products.
9. The NTFP industry is well established and has developed its own system of values and norms.
10. No resource revenues collected by government. Some revenue collected by some owners of private forest land.
11. Monitoring and enforcement capacity does not currently exist.

Determining the appropriate institutional response and management regime can be aided by understanding the previous resource characteristics in relation to the following attributes:

- Resource attributes: improvement possible through organization; information is reliable and valid; the resource flow is predictable; and the resource is geographically manageable.

- User attributes: dependence on the forest; shared image of the forest; low user discount rates; even distribution of interests in resource use; trust; autonomy from outside intervention; and prior organizational experience
- Other potentially important attributes include the size and heterogeneity of the user group.

The interests and capacity of existing management agencies are a key factor in whether and how institutional change will occur. The design of an appropriate management regime for NTFPs will depend on three agency influences:

- the agency's management objectives and their source;
- its structural or institutional biases against alternative regimes; and
- its monitoring and enforcement capacity, whether for its own system or to provide the necessary support for a user enforced type of system.

Finally, an effective management system should reflect, among others, the following characteristics:

1) The benefits of change should clearly exceed the costs of both change and the enforcement of the new rules, otherwise users will not willingly adopt the new management regime.

2) Managing the resource stock and managing the industry that profits from the resource flow have different requirements and it cannot be assumed that addressing the issues of one will solve the issues of the other.

3) Due to the lack of information and uncertainty of any particular management approach, an effective regime should reflect adaptive management principles.

4) Any regime must be respectful of traditional and other personal uses by including the appropriate rights and responsibilities to ensure these non-commercial rights.

Clearly, expecting a homogenous management regime is an unlikely solution to the NTFP management dilemma, given the complexity of NTFPs. Designing systems that reflect the heterogeneity of these resources will require the use of a variety of potentially overlapping resource rights, in an effort to offer an effective means of managing for multiple objectives and multiple products.

5. Property rights in NTFPs: developing and effective, efficient and equitable management regime.

5.1. NTFP management: one size fits nothing

Balancing the stewardship of our forests for ecological integrity and as a source of resources for human consumption is at the heart of this discussion. Stewardship, however, does not simply 'happen' within a complex system of products, users, rights and values. As discussed earlier in this paper, state intervention and the specification of property rights can lead to better stewardship and is justified in cases of negative externality and when the benefits of creating, allocating and enforcing rights exceed the costs. In the case of NTFPs in British Columbia at this time, should we expect the benefits of property rights to exceed the costs? The short answer is "yes" - for some products, in some places.

Over time, we should expect that the specification of rights will be desirable for more products and in more places, until a system approaching full specification of rights is achieved. In such circumstances, the challenge to policy makers is to create a system that specifies the property rights regime that will be implemented, contingent upon specific conditions and, further, that provides incentives for resource managers and users to *create* conditions that will maximize the benefits of clear property rights and minimize the costs.

As outlined in Section 2, NTFPs are characterized by their extreme heterogeneity (heterogeneity of products, uses and users) and by how little we understand them. Any system of property rights for NTFPs and its accompanying institutional framework must be sufficiently flexible to accommodate such variability and to allow legislators, managers and resource users to learn efficiently and to effectively employ new knowledge in responding to management challenges.

In designing a system of property rights for NTFPs, questions of technical and economic efficiency are important; equally important are issues of how to facilitate implementation of the system (or systems) and how to render the system "compliance friendly." Even the best-designed system will meet resistance from many quarters, even if the overall gains from new management systems substantially exceed the overall costs.

In the history of resource management, the aggregate gains from better management generally have been well recognized long before actual change has taken place. In extreme cases, the (total) cost of exploiting a resource may substantially exceed the returns from the resource, as was the case in the latter years of the East Coast cod fishery, before any effective action is taken.

Knight (1992) argues that aggregate gains, however large, are the wrong focus for understanding whether and how institutional change takes place. He observes that strategic actors (i.e., those who are materially affected in some way by institutional change) focus, not on collective goals, but on the institutions that produce those social outcomes that are best for them as individual strategic actors (Knight, 1992:38). Libecap (1995:168) states that, even if all of the actors agree that everyone will benefit (in total),

> … the problem is reaching agreement on (the distribution of) benefits and costs of collective action. If the negotiations are lengthy, many resource rents can be lost before collective action is initiated. Finally, after conditions become so severe regarding the state of the resource and the ability of the parties to obtain income from its use, agreement on closing some of the margins for rent dissipation becomes possible through collective action. Unfortunately, delays in such cases may result in resource rents having been permanently dissipated, or in the resource having been physically destroyed.

The alternative to action "too little too late" is for property regimes to be established before there is significant exploitation of the resource. The fact that there are few formal *de jure* rights in non-timber forest products suggest that this "early intervention" approach might be possible. However, as discussed earlier in this paper and in Section 5.2, informal rights, claims, expectations and interests of key strategic action are already well established in regard to key NTFP species and products and in regard to the issue of whether NTFPs ought to be managed at all.

5.2. Goals, interest and claims

Where there are many strategic actors concerned with a particular policy issue or set of issues, it can be very difficult to identify and understand the forces that support institutional change as opposed to those that resist change. For any one set of actors, it is likely that they will have interests that are both "pro" and "con". Where policy relevant information is scarce (as is the case in regard to NTFPs), strategic actors may lack fully developed preferences or, at least a complete understanding of implications of positions they assume. Often, positions taken on comparatively new policy issues can be highly coloured by experiences in similar policy situations. For example, residents of areas that have experienced major resource extraction may see the management of NTFPs as yet another step in what they perceive as the systematic exploitation and "export" of local resources. Similarly, if the agency that devises and implements a new policy is distrusted or disliked, this perception may inhibit discussion of options that, on their merits alone, would be better received.

The following table outlines a provisional list of the goals and interests of major strategic actors. This list is preliminary in nature and subject to discussion and confirmation.

Table 3: Stakeholder interests and goals of NTFP management.

Strategic Actor	Interests/goals that support institutional change in NTFP management	Interests/goals that oppose institutional change
Provincial Government of B.C. (as a whole)	• new revenue potential • stewardship of public resources • reduce actual/potential conflict among resource users • potential resource for negotiation in First Nations treaties	• administrative burden and associated costs (may exceed revenues) • policy change may highlight/focus/heighten conflict among resource users ("let sleeping dogs lie") • creation of property rights would create new issues in treaty negotiations
First Nations	• means of confirming both traditional rights and economic opportunities through secure access to resources • revenue potential from rents/administrative fees • employment and business opportunities	• increased infringement on traditional rights and access; perceived "privatization " of additional resources and exclusion of First Nations access • concerns about environmental sustainability and ongoing contribution to subsistence food supply
Ministry of Forests	• means of addressing actual and potential conflicts among forest resource users • diversification/sustainability of forest values • revenue base to support management activities	• potential regulatory burden and costs • requirement to negotiate/mediate conflicts among forest users
Forest Companies (licensees)	• create means of managing issues such as trespass, • company liability for e.g. fire, damage to timber, • equipment • potential for companies (among others) to acquire tenures for valuable forest resources • better knowledge of NTFPs (funded through commercial development) may reduce costs of meeting other requirements e.g. biodiversity • contribute to meeting requirements for certification • opportunities to stabilize local workforce	• recognizes/legitimizes another overlapping use of forest lands – complicates planning and operations • costs if more management responsibilities imposed on forest companies
Private Forest Land Owners	• property rights not an issue for private owners, but may welcome reform on public lands to "level the playing field" and reduce trespass/poaching • larger, better organized industry would benefit those private owners wishing to develop NTFP resources.	• none

Current NTFP commercial harvesters	• potential to obtain more secure access to resources and hence income • protection of current or proposed investment in NTFP production (e.g. fertilizing, harvest timing) • may limit new entrants and thus new competition	• concern that more formalized system will squeeze out current harvesters (reduce or restrict access to established harvesting areas, e.g.) • cost concerns (permits, more rigorous requirements for income reporting) • threat to flexible lifestyle preferences (e.g. geographic mobility)
Recreational and subsistence harvesters	• opportunities to identify and protect recreational and subsistence harvesting areas	• industry expansion and infringement on harvesting areas • potential burden of permitting for these uses and limitations on quantities, etc.
Current NTFP industry (buyers/exporters)	• Opportunities to acquire secure access to resources that would facilitate business planning and investment	• Similar concerns of harvesters – more administrative and cost burden. • Less flexibility and mobility – also potential for labour legislation that would increase costs
Aspiring NTFP businesses	• Opportunities to acquire access to product	• Potential new barriers to entry
Local governments/communities	• revenue potential for increased employment, business development, possible share of resource revenues • reduced actual/potential conflict among resource users • potentially better control of issues such as squatting," litter, fire	• depending on nature of tenure system, local communities may be find it difficult to secure access • perception that resources and income will benefit "outsiders" rather than local residents and communities
Federal Government	• More formal management likely to reduce federal concerns re. non-reporting of income, use of NTFP businesses as fronts for illegal activity • increased revenue	• potential administrative burden and costs for law enforcement
Researchers	• should support research through increased commercial interest and through generation of resource revenues	• Increased utlization of product without adequate ecological, economic and social research to ensure sustainability
Groups concerned with environment, including non-human interests	• Avenues to protect environmental interests by excluding/managing use in sensitive areas • more support for research	• Property rights may contribute to increased extraction of forest resources without adequate knowledge base or enforcement

Creating a property rights regime for NTFPs and the necessary machinery for its implementation will be, like all policy changes, subject to the problem that the costs and benefits of change will rarely if ever be borne by the same individuals in the same proportion. As discussed in Section 4, a good deal is known about the conditions for successful management of common pool resources. To achieve objectives of both efficiency *and* equity, policy options should be assessed according to the following overall criteria and be analyzed in relation to the interests and goals identified in the above table.

Does the proposed system:

- recognize the ecological diversity of NTFP species, the economic diversity of NTFP uses, and the social diversity of NTFP users?
- promote stewardship of NTFP species and the ecosystems in which they flourish and create incentives for investment in the resource?
- generate rents to the owners of resources based on fair market value of NTFP species consistent with rents charged for other forest resources?
- involve those who use and manage NTFPs in the creation of systems to manage these resources?
- minimize the transaction costs associated with coordinating users of forest resources?
- create incentives for users and managers to adhere to management regimes established for NTFPs?
- provide for appropriate sanctions for non-adherence to management regimes?
- provide low-cost and effective means of mediating conflicts?
- recognize and support existing rights in and to forest resources?
- identify and direct revenues from NTFP utilization toward research, management, and sustainable community development?
- encourage, and if necessary, enforce, reasonable employment standards and working conditions for employees and contractors?
- create financial benefits that exceed the total costs of administration of the system?

5.3. Structuring an adaptive regime of property rights for NTFPs

As discussed earlier in this paper, "property" describes a bundle of rights that may be created by more than one rule-maker and may be held by more than one rights-holder. In complex situations (such as that of managing multiple forest resources and allocating their use among many potential users), a property rights regime will need to respond to this complexity, without itself being unnecessarily complicated or expensive.

The optimal management regime for NTFPs would achieve ecological, social and economic benefits that follow from better specification of property rights and would do so in a way that is consistent with, or at least complementary to, current management directions and policy priorities of the provincial government. Key government priorities are considered to be:

- enhancing opportunities to generate wealth from forest and range resources;
- ensuring that the public receives fair value for the use of its forest and range resources now and in the future;
- ensuring performance standards for managing timber, forage, bio-diversity, water, soil, forest habitat, and scenic resources are established and enforced
- increasing the management responsibility of the private sector; and
- contributing to the Results-Based Code Linkages to Criteria and Indicators of Sustainable Forest Management.

In addition, the management regime for NTFPs must incorporate the legal obligations of the province to consult with all affected First Nations.

For the purposes of identifying management options, we consider the structure of the NTFP industry to consist of 5 "levels"

- individual users/harvesters;
- tenure holders (currently the provincial Crown);
- buyers/wholesalers/distributers;
- retailers;
- and consumers,

Conceptually, the same individual or organization could occupy several of these positions and in the case of recreational, subsistence, traditional, and direct retail uses, not all levels will be relevant. Management actions can be implemented that are directed to any, several or all of these levels and these actions can be assessed against relevant criteria. In the following matrix, we outline some of the key management options, by level and (roughly) assessed against efficiency, equity and other criteria. In each case, actions are assigned a score of 1 (lowest) to 5 (highest). Not all components have a rating number, as there is a limited amount of information available to policy makers and a limited amount of examples from which to draw inferences. Actual management trials will help complete the matrix. In practical terms, each of these options is not independent of all others. The purpose of identifying each theoretically indendent element is to help us construct a management "package" that is both internally consistent and that meets as well as possible the criteria established for evaluation. There will be a number of trade-offs as we attempt to do the best possible with some criteria that are not themselves consistent with each other.

Table 4: Rating of management options and property rights characteristics for NTFPs.

Rating system: 1(lowest) – 5 (highest)
N = neutral

Definition of industry / user abbreviations:
NTFP Industry---------------------- NTI
First Nations ------------------------ FN
Other stakeholder/community---- C
NTFP harvester ---------------- H
Timber tenure holders -------- TT

Ratings are only relevant within the particular category, not across categories. For example, in category A NTFP rights and timber tenures, sub-category A2 scores higher than A1; however, A1 (or A2) is not superior or comparable to sub-category B2. Scores are based on the authors' judgement and should be considered preliminary and subject to ongoing revision.

Action	Industry level(s) affected	Overcomes property rights problems related to over-harvesting	Overcomes property rights problems related to under-investment	Reflects diversity of the resource and its uses	Consistent with current government management and priorities	Protects current users	Generates revenue to the public as rents	Total rating
A. NTFP rights and timber tenures								
A.1. Create property rights in NTFPs that may be held only with timber rights	H, FN TT NTI	4	3	2			2	11+
A.2. Create property rights in NTFPs that may be held independent of timber rights	H, TT, NTI, FN, C	4	3	4			3	14+
B. NTFP rights by species								
B.1. Property rights created for single species, or species group	H TT	3	3	4	4			14+
B.2. Property rights created for all species	H TT	3	3	3				9+

Action	Industry level(s) affected	Overcomes property rights problems related to over-harvesting	Overcomes property rights problems related to under-investment	Reflects diversity of the resource and its uses	Consistent with current government management and priorities	Protects current users	Generates revenue to the public as rents	Total rating
C. Granting of rights to NTFPs								
C.1. Tenures/licences/permits directly administered by government agency (e.g. Ministry of Forests)	H NTI TT	2	2	2	2		3	11+
C.2. Tenures/licences/permits granted by government agency/ permits (if any) administered by tenure holders	H NTI TT	3	3	3	3		3	15+
C.3. Tenures/licences/permits administered by third party agency and permits administered by tenure holders	H NTI TT	2	2	3	3		2	12+
D. Geographic scope of rights to NTFPs								
D.1. Implement appropriate management system province wide/mandatory	H NTI	4	4	2	2	1	4	17
D.2. Implement system on voluntary application basis	H NTI	4	4	2	2	3	2	17
D.3. Implement system in priority areas (mandatory)	H NTI	3	3	2	3	2	3	16
D.4. Implement system in priority areas as pilot projects	H NTI	3	3	4	4	3	3	20

Action	Industry level(s) affected	Overcomes property rights problems related to over-harvesting	Overcomes property rights problems related to under-investment	Reflects diversity of the resource and its uses	Consistent with current government management and priorities	Protects current users	Generates revenue to the public as rents	Total rating
E. Individual harvester permits								
E.1. Create permitting system for individual harvesters (no tenures)	H	2	2	4	2	4	3	17
E.2. Create permitting system for individual harvesters under tenures	H NTI TT	3	3	4	3	3	4	20
F. Buyer licences								
F.1. License buyers / wholesalers / distributors for information purposes only	NTI	2	2	2	3	3	2	14
F.2. License buyers, etc. and charge fees unrelated to volume, product and source of product	NTI	1	1	1	2	3	3	11
F.3. License buyers etc. and charge fees related to volume, product and source of product	NTI	3	3	3	4	2	4	19
G. Individual permit fees								
G.1. No charge for individual permits	H	1	1	1	1	4	2	10
G.2. Charge for individual permits (with some free use exceptions e.g. traditional, recreational use)	H	2	2	3	2	3	3	15

Action	Industry level(s) affected	Overcomes property rights problems related to over-harvesting	Overcomes property rights problems related to under-investment	Reflects diversity of the resource and its uses	Consistent with current government management and priorities	Protects current users	Generates revenue to the public as rents	Total rating
H. Rent and administration based fees								
H.1. No charges for NTFP tenures	NTI TT	2	2	1	1	4	1	11
H.2. Charges resource-based rents	NTI TT	3	3	4	4		3	17+
H.3. Charges for administrative-based fees	NTI TT	2	2	2	3		2	11+
H.4. Charges administrative and resource rent based.	NTI TT	3	3	3	4		4	17+
I. Allocation of revenues								
I.1. All revenues (fees, rents, licences) to Gen. Revenue	NTI	2	2	2	4		4	14+
I.2. Some revenues (administrative costs) to tenure holders	NTI	2	2	3	3		3	13+
I.3. Revenue sharing among government, tenure holders, communities, and provision for research and industry development.	NTI FN C	4	4	4	3		3	18+
J. Transferability								
J.1. Transferability Fully transferable	NTI	3	4		4	2	3	16+
J.2. Transferable with restrictions	NTI	3	3		3	3	3	15+
J.3. Not transferable	NTI	2	1		1	3	1	8+

The analysis presented in the above matrix suggests that a "good" management system should incorporate most or all of the following elements:

1. Property rights should be available independent from timber rights, but combining timber and NTFP rights should not be rejected where appropriate;
2. Property rights should be created for single species or species group depending on particular conditions – blanket property rights for all species is not appropriate at this time.
3. Government should grant property rights, with any subsequent permitting of harvesters to be done by holder of tenure or licence if applicable.
4. Permitting system for harvesters alone is not a practical method and if undertaken should be nested within licence or tenure system only.
5. Returns to the owners of the resource should be obtained at several points in the system, and coordinated to encourage the highest level of investment in, and stewardship of the resource, specifically: licence buyers and base fees on volume, product, and source of product.
6. If permitting system is developed for harvesters, charges should apply.
7. Charges should be based on resource rents and if appropriate also cover administrative costs.
8. Revenue sharing and provisions for research and development would reflect optimal use of revenues.

5.4. Summary: NTFPs and the nexus of goals, objectives, and ratings.

From the perspective of designing a management system for NTFPs, there are four basic models. Each of these models represents a package of the elements presented in Table 4 and each can be assessed against the criteria presented in section 5.2 and 5.3.

As concluded at the end of Section 4, an effective management system should reflect, among others, the following general characteristics:

1. The benefits of change should clearly exceed the costs of both change and the enforcement of the new rules, otherwise users will not willingly adopt the new management regime.

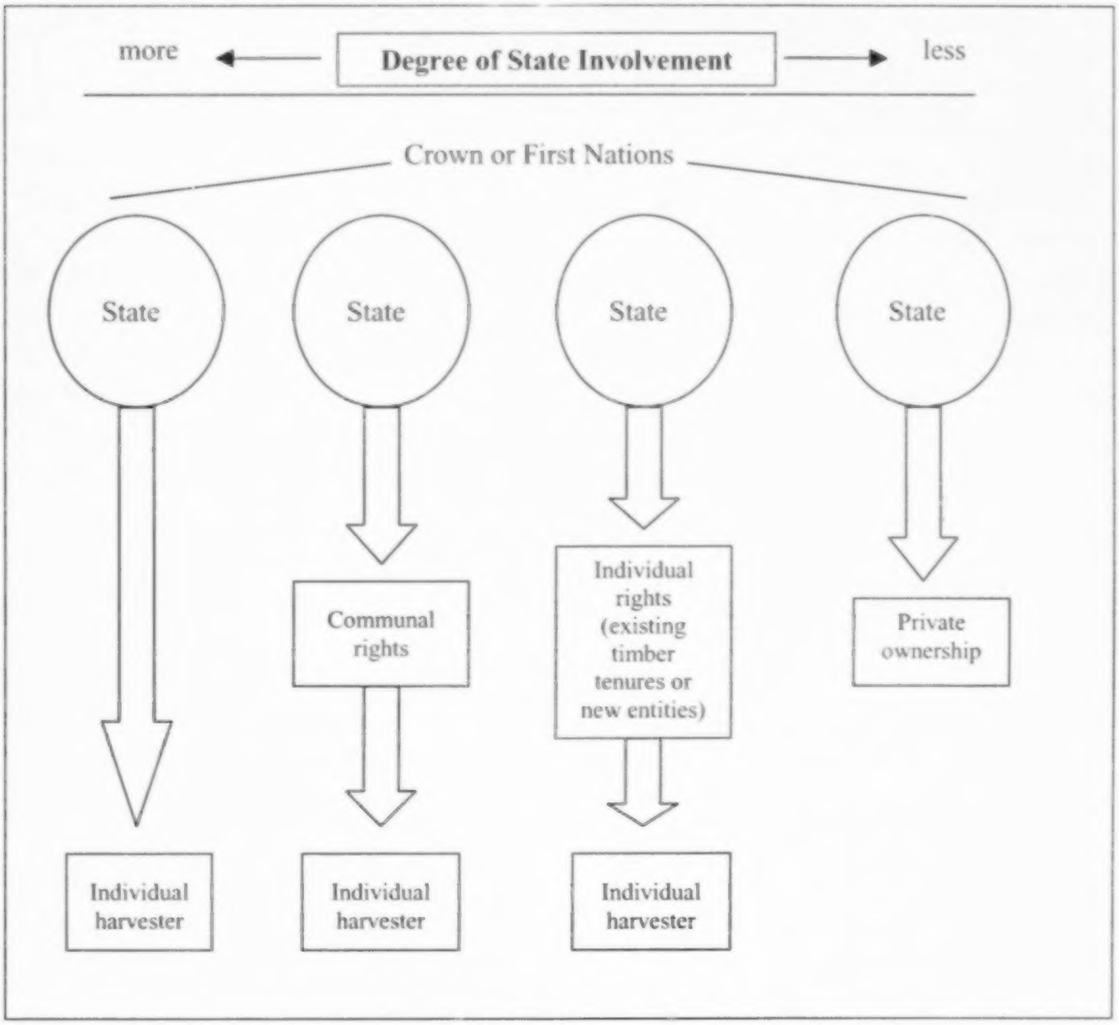
2. Managing the resource stock and managing the industry that profits from the resource flow have different requirements and it cannot be assumed that addressing the issues of one will solve the issues of the other.

3. Due to the lack of information and uncertainty of any particular management approach, an effective regime should reflect adaptive management principles.

4. Any regime must be respectful of traditional and other personal uses by including the appropriate rights and responsibilities to ensure these non-commercial rights.

The four basic models are represented graphically in Figure 1 below, on a continuum ranging from less to more State involvement.

Figure 2: Provision of property rights by degree of state involvement.



A possible application of each of these basic models to NTFP management is described below, together with some advantages and disadvantages of each model.

5.4.1. State Based Management

A state-based approach to resource management extends the state's involvement to a more active role in the planning and operational side of resource use. State-based management not only refers to state ownership, but also to the management role taken by the state or its agencies. It is a system in which at the extreme all management and planning responsibilities lie with government.

As the above diagram shows, the relationships in this system are between the state as landowner and manager, and individual harvesters who are authorized in some manner, such as permits, to use the NTFP resource according to rules set by the government. The permit might state where the harvester can work, how much he or she can harvest, what fees the harvester will pay, and so forth. This model is generally familiar and well understood, often being the first form of management that is attempted in resource harvesting - individual fishing licenses are an example.

An example of a state-based approach to NTFPs would be the management of the North American Matsutake harvest in the Central Oregon region of the U.S. Pacific Northwest where the individual resource user is targeted. The U.S. Forest Service manages the land on behalf of all U.S. citizens and takes an active role in the daily management of the resource. Each harvester is required to obtain a permit from a local Forest Service office, harvesting can be limited to specific areas if necessary, and harvesters have designated camping areas.

Advantages

- Management would lower the current high discount rate related to harvesting leading to less intense harvesting on smaller areas.
- Could overcome the difficulty in coordinating a large number of users, a lack of user cooperation and high transaction costs.
- The state may place a higher value on social issues and objectives than private or individual entities, leading to a more equitable, but not necessarily efficient system.
- Land owner (Crown) would receive rent for use of its resource.

Disadvantages

- Costs of monitoring and enforcement would be high and borne by the state.
- Enforcing rules and preventing unauthorized harvest would remain problematic.

- Would not encourage intra-user cooperation to overcome management issues, unless mandated to do so.

- Would likely be met with the most resistance by user groups and other stakeholders.

- Failure to exercise prescribed control could lead to over-exploitation of the resource.

- May displace current users of resource, be they commercial, personal or traditional users.

- Permit costs would not likely be responsive to market conditions potentially limiting the profitability and viability of the industry.

5.4.2. Communal Rights

In this model, the state confers or recognizes the rights of a group to jointly use and manage NTFP resources. As discussed earlier in this paper, many traditional resource management systems are of this type. The rights of individual harvesters are held within the "common property" held by the group. Even where these kinds of arrangements have not evolved over time, management regimes can be devised that create the same incentives and obligations that exist in long-standing common property arrangements.

An example of such a management regime is a shared-area licence. While individuals or business entities are provided with the property rights, they are tied to other users via a common licence, which provides coordination through shared values and a common resource objective. Shared-area means all licensed harvesters share an area and its volume and would be responsible for planning, operations, and monitoring within the designated licence area. Co-licensees could be legally bound, for example by apportioning percentage rights to the licence, each being liable for the licence as a whole, thereby creating a more dependent relationship.

Shared-area licences are intended to use a common property institutional structure combined within a state-based definition of property rights and enactment of appropriate laws to provide the necessary penalties for trespass and the transgression of rights and responsibilities.

Advantages

- By restricting the number of resource users within a shared-area the incentive for the NTFP industry to collaborate in management, investment and enforcement would increase, more so than if separate areas were provided to individual users. This is due to the greater security provided by a larger number of licensees active and with an interest in the area.

- The approach would move the management and user-group enforcement responsibilities from government to those using and directly benefiting from the resource.

- Management would lower the current high discount rate related to harvesting leading to less intense harvesting on smaller areas.

- Would be more consistent with objectives of sustainable forest management.

- Collaboration among harvesting companies could lead to some economies of scale, lowering per unit production costs thereby minimizing dissipation of rents.

- Land owner (Crown) would receive rent for use of its resource.

Disadvantages

- Common property approach requires actors to have some shared trust among group members and a clear understanding of the potential benefits. The lack of organizational experience may indicate need for government to clearly identify collaborative benefits, pay for initial transaction costs, and provide for other incentives.

- Depending on the number of users, if one licensee abuses the regime, other shared-area licensees may follow if penalties are not sufficiently enforced.

- A perceived lack of benefits associated with licence and industry collaboration coupled with the availability of alternative harvest locations for the same products may limit the incentive for NTFP industries to cooperate with new management system.

- Will not completely overcome problem of unauthorized harvest.

5.4.3. Individual rights

In this model, rights to use and manage NTFP resources are assigned to individual entities, such as existing forest licensees, individual proprietors, corporations or co-operatives. These rights are exclusive in that the holder is not obliged to share management or control with other co-users as is the case in the common property model. The rights themselves may be more or less extensive, however, and could be quite limited in duration, number of species to be harvested, and harvesting area, and could provide varying degrees of control over harvesting and management practices.

Two examples of individual rights would be:

1) to include exclusive rights to NTFPs in any form of tenure that provides exclusive rights to timber. For, example, area based usufruct rights to timber could become more complete, or well defined to include a more exclusive and comprehensive right to a greater number of products and values within the forest land base.

2) to create exclusive rights to NTFPs that would be provided separately from timber rights. In this case, it would be necessary to devise means for coordinating the use of the same areas of land for both timber and NTFP harvesting.

Advantages

- Either of these approaches would encourage greater investment in, and stewardship of NTFP resources
- Forest resources would be utilized more efficiently and it is likely that greater attention would be paid to optimizing timber/non-timber management if a single owner/tenure holder benefits from a greater range of resources on the land
- The approach would move the management and user-group enforcement responsibilities from government to those using and directly benefiting from the resource.
- Management would lower the current high discount rate related to harvesting leading to less intense harvesting on smaller areas.
- Would be more consistent with objectives of sustainable forest management.
- Collaboration among harvesting companies could lead to some economies of scale, lowering per unit production costs thereby minimizing dissipation of rents.
- Land owner (Crown) would receive rent for use of its resource or revenues in the case of sale of forest lands.
- Experience in the United States suggests that private forest landowners are motivated to maximize returns from their lands, including harvest of NTFPs and to be concerned with long term sustainability of the resource.

Disadvantages

- Either of these approaches will tend to limit the range of individuals and groups who will be able to acquire property rights in NTFPs, although NTFP rights separate from timber are more likely to be accessible to a wide range of entities.

- Holders of timber/non-timber tenures may neglect the potential benefits of NTFPs relative to timber, due to unfamiliarity with the "new" resources, while excluding existing commercial, traditional or recreational harvesters from their established harvest areas.
- Government may be required to offer a higher level of enforcement or protections of conferred rights if price for exclusive tenure high.

5.4.4. Private Ownership

In this model, which is not contemplated in this discussion paper, there would be an extension of the system of privately owned forest lands in British Columbia. The advantages and disadvantages of this model are similar to, but more pronounced, than those described for "individual rights"

5.5. Example: Definition of property rights bundle

The following discussion outlines the potential way in which rights to NTFPs could be defined.

Comprehensiveness

Property rights would include all brush products, including salal and any other NTFPs of commercial value that are ecologically and culturally appropriate to harvest. Products included in the rights would be defined or listed in the licence agreement. The area under licence would depend on the product and the optimal geographic scope, based on a number of criteria including distance from population centres, ability to effectively monitor and enforce, and product availability and productivity. The rights would not include timber or any other product or service not defined in the licence agreement. The licence could be designed as subordinate to rights to timber.

Exclusivity

Rights to defined products would be exclusive to a defined area and for those companies under licence. Specification of licensee responsibilities would be detailed in license agreement.

Benefits conferred

Users would be given the right and protection to benefit exclusively from the resource and any additional benefits associated with improvements. Rents would be payable to government, reflecting both the value and the costs associated with the licence.

Duration

Licences would be renewed annually, and depending on the licensee meeting licence requirements and other contract stipulations, including reporting of volumes and values, and payments of fees. At the end of the term, licensees would be offered the right of first refusal. Over time the renewal length of the licence could be extended.

Transferability

Transferability of licence or licence-share would be allowed, but under a shared-area system the number of shares held by any one company or entity could be limited. New entrants would depend on the availability of resources, and if entry not available in one area additional individual or shared area based licences could be established.

5.6. Recommended implementation model

In examining the above management models, each with its advantages and disadvantages, we may conclude that in principle, the state should maintain its prescriptive role, but minimize any operational role.

Our current system of managing the land base allows for an overlapping and interdependent system of rights and responsibilities. This will provide a foundation upon which a variety of approaches can be tested for several products under various conditions. Monitoring and evaluating the most effective, efficient and equitable systems will be an ongoing effort.

The most efficacious approach will most likely combine elements of the three management approaches: state, common property, and private.

Finally, providing rights to resources, be they on private or public lands, requires some form of rent in return. Given that revenues are collected in the Pacific Northwest and on private forest land in British Columbia, it cannot be argued that collecting rents from the NTFP industry for the use of public lands in British Columbia would lead to a loss of industry activity.

5.6.1. NTFP Pilot Project

The complexity of NTFP systems (ecological, economic and social) and the limited information base available to policy makers provides a strong argument for an adaptive management "experimental" approach to management reform. The following strategy is proposed with a 2-3 year time horizon, with ongoing monitoring and evaluation during the implementation phase.

The pilot will incorporate existing legislation regarding NTFPs with the management approaches identified in this paper. The pilot has two components with overlapping but differing scopes:

1. A buyer licensing and reporting system; and
2. The development and testing of usufruct options.

NTFP Pilot Project: Buyer Licensing and Reporting System

As discussed in Section 3, the *Forest Practices Code of British Columbia Act* provides the basis for developing regulations to licence buyers of NTFPs (botanical forest products as they are referred to in the *Code*), and to allow the inspection of vehicles transporting "botanical forest products" and to produce records related to licensed activity.

Fundamental to the success of management options under the pilot project is to be able to identify NTFPs harvested and shipped from the pilot area. As such, within the broader economic region of the NTFP species targeted for management, government will need to establish a buyer's licensing system. The licensing system could include the purchase of a buyer's licence and a requirement to report products harvested by species, volume, value and geographic area (forest district level). Fees collected under this licensing system would ideally fund the development and monitoring of the NTFP pilot project.

NTFP Pilot Project: Development and testing of management options

A pilot project would offer the opportunity to introduce, monitor, and evaluate alternative property rights regimes in a setting where NTFP activity already occurs. This ideal area would be one where research and community development work has taken place and harvesting is established, but where there is little industry infrastructure and considerable flexibility in how the industry may develop. The property rights tools would be designed to fit within existing institutional structures (i.e., within TFLs or TSAs). Under each management option, reporting of volumes and values would be mandatory.

On TSA lands, government would initially provide tenures or licence agreements to a variety of parties interested in harvesting NTFPs. Examples of options to allocate harvesting rights to NTFPs include:

- temporary pilot plots based on area or volume;
- auction of areas with high NTFP values based on area or volume; and
- licensing of NTFP companies with no designation of harvest area or volumes.

The property rights conferred would be based on a combination of state, common property and individual rights as discussed in Section 5.4. For example, within TSA lands a shared-area licence system could be established that would provide the rights to specified NTFPs to more than one individual or entity.

On TFL lands, management options would include providing TFL holders with more comprehensive rights to resources within their management areas. By providing the property rights to NTFPs, TFL holders would then determine how best to allocate NTFP harvesting rights, whether that would be through transferring or selling the rights to a third party, or, for example, through the establishment of a separate NTFP business entity.

More detailed components of the pilot include the following:

1. Determine which forest companies would be willing to participate in an NTFP management pilot project.
2. Invite interested groups (First Nations, NTFP buyers, community organizations, local government) to work with researchers/managers to design an NTFP tenure pilot –this process would address issues such as location, preservation of traditional and recreational uses, how to allocate, how to evaluate, etc.
3. Explore options for dealing with First Nations issues, such as interim measures agreements, in the context of the pilot project.
4. Identify resource needs to implement and evaluate the pilot – to be obtained from licensing fees/resource rents from tenures and other sources such as forest companies, foundations, and research programs. Implement and evaluate pilot (2-3 years) – ensure ongoing formative evaluation and extend results as broadly as possible.
5. Collaborate with other provincial and federal agencies in establishing management regime and pilot program.
6. Develop a NTFP industry association to establish self-monitoring and enforcement capabilities.

Early extension of pilot system

If there is demand from other parts of the province for implementation of the strategy, they should be made available if:

- regional buyers are licensed and pay fees as per above;
- interim results from the pilot do not indicate serious or insurmountable problems that argue against this type of management regime for NTFPs.

At least six months should elapse from the implementation of pilot tenures before new projects are contemplated.

5.6.2. Government Revenues.

Government revenues would come from two sources: licensing of NTFP industry and charging resource rents. Fees would be collected under the General Revenue System, should initially be protected and designated to meet appropriate pilot and research funding requirements. Cost of incorporating these fees into system would be marginal. There are a variety of options for incentive-based revenue collection systems that could be explored during the pilot.

Table 5: Potential NTFP revenues versus other government revenues.

	Avg. direct sales revenue 1997 ($millions)	Revenue (or potential) to Crown ($millions)	Value of exports ($millions) 2001	Crown revenue / sales revenue (%)
Special Forest Products[1]	-	0.887	-	-
NTFPs total value estimate[2]	280.0	20.0	-	7.0
NTFPs estimate – Mushrooms[2]	25.0 – 50.0	1.0 – 3.0	15.0 – 32.0	7.0
NTFP estimate – Florals[2]	55.0 – 60.0	3.8 – 8.7	16.5 – 50.0	7.0 – 14.0 -
Christmas trees	-	0.008	0.452	NA
SBFEP	-	291.40	-	-
Range fees	-	2.05	-	-
MAFF all fees and licenses	-	0.49	-	-
MoF recreation site fee program	-	0.80	-	-
All timber & SFP	17,448.4	1,218.0	-	7.0

Notes: 1. special forest products include shake and shingle, fence posts, cants, firewood, stakes, sticks etc. 2. NTFP sales revenue from Wills and Lipsey; mushroom sales value from Wills and Stats Canada – Stats Canada data reflects export volumes only; additional volumes are harvested and consumed locally. Sources: Revenue to crown, other than NTFP revenue, from Revenue Branch, Ministry of Forests. All timber and SFP sales revenue from PriceWaterhouseCoopers is for total sales of all forest products.

Table 6: Potential NTFP revenues from most visible NTFP products.

Product	Est. quantity harvested (million kilos.)	Est. government Revenue ($ millions)	Est. wholesale revenue ($ millions)
Floral Greens[1]	16.3	4.2 - 8.7[2]	55-60
Edible wild mushroom[3]	0.5 – 1.5	1.03 – 3.3	14.7 – 46.8
Total	NA	5.2 – 12.0	69.7 – 106.8

1. Includes salal, huckleberry, ferns, boxwood, Scotch-broom etc. Includes boughs, but below full value.
2. Potential government revenue based on 7% of wholesale value (low end) and Feb. 2002 brush auctions in Washington State (high end).
3. Edible wild mushroom low estimate is based on export data from Statistics Canada for exports to Japan and Europe only. Domestic supply and exports to US excluded. Resource value to government based on 7% of wholesale value (7% estimate from ratio of stumpage to value of shipments of wood products). Edible wild mushroom high estimate based on estimated harvest volume from Wills and Lipsey, 1999. Wholesale value is based on average 1996-00 declared export value for shipments to Europe and Japan of Cdn$ 31.22.

Appendix 1: NTFP characteristic matrix[48]

1. Biological, physical and technical characteristics

Characteristic Key Question	Edible wild mushrooms	Floral and greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Multi-species or single species What species are harvested?	Multi-species. Dozens of species harvested for commercial and personal use. Most commercially important species are: pine mushroom / American Matsutake (Tricholoma magnivelare), Chanterelle (Cantharellus formosus); King Bolete (boletus edulis); Morels (morchella spp.)	Multi-species. Primary commercial species are Salal (Gaultheria shallon); sword fern (Polystichum munitum); false box (Pachistima myrsinites); Evergreen huckleberry (Vaccinium ovatum); and deer fern (Blechnum spicant). Conifer boughs and cones are also used extensively, including western red cedar (Thuja plicata); Douglas fir (Psuedotsuga menziesii); western white pine (Pinus monticola) and grand fir (Abies grandis). De Geus (1985) identifies 31 commercial species in British Columbia, including mosses, lichens and florals.	Many species. De Geus (1995) identifies 31 fruits and berries harvested commercially in B.C. and 18 species of wild vegetables and culinary herbs. Berries are the more important of this group; the principal species harvested are the vaccinium species (blueberries, huckleberries), blackberries (Rubus sp), Saskatoons (amelanchier alnifolia) and salal berries (gaultheria shallon).	Many species. DeGeus (1995) identifies 44 native plants used in landscaping and restoration - 1 tree species , 19 shrubs and 24 herbaceous species. TheNative Plant Committee of the BC Landscaping and Nursery Association lists 13 species of perennials and ground covers, 22 shrubs and 9 trees as available from at least 3 nurseries in B.C. Despite many overlaps, the two lists (wildcrafted versus propagated) are substantially different. Native woody plant seeds also of interest.	At least 24 species. Willow, alder, grasses, sedges, whole plants, leaves, bark, roots mosses.	Commercial: at least 140 species in NA. Trad./personal: potentially hundreds. Species harvested/products wildcrafted or of commercial interest in BC are St. John's Wort, Oregon Grape, Cedar oil, Devil's club. Others include nettles, burdock, camomile, cascara, yew, etc.
Temporal heterogeneity Is the resource available : - Each year - Seasonally - Year round	Some species available each year (Pine mushroom, Chanterelle); some are more variable (Morels). Most commercially harvested edible wild mushrooms are available on a seasonal basis only.	Most species would be available every year, although quality and abundance would be affected by moisture and other conditions. Most species can be harvested year round except during the spring growing season when the plants are too "soft" or fragile to transport. Seasonality may relate more to access (roads closed by snow in winter) or seasonal demand (e.g. for Christmas greens).	Berries probably most variable as affected by frost at flowering time, etc. Berries and other wild foods are seasonal. Berries mainly summer/fall; "greens" (e.g. fiddleheads) in the spring/early summer; roots in the late summer and fall.	Seasonal availability depends on species. Most plants best salvaged in fall/winter when they are dormant.	Products available all each year, seasonal availability depends on species.	Products available all each year, seasonal availability depends on species.

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[48] Adapted from Mitchell, 1997.

1. Biological, physical and technical characteristics – cont.

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Spatial heterogeneity Is the resource available in the same place each year? Is the resource available in the same volume each year? Risk level?	Some species (Pine mushroom, Chanterelle) available in the same stand as the fungus remains intact, but fruiting (i.e., volume harvestable) may not occur in the same volume and same place each year. Morels are most abundant the year after fire. Annual volumes can be highly variable. Volume uncertainly increases the business and investment risk level associated with mushroom harvest.	Spatial heterogeneity much less than with .e.g mushroom species. Not known. Previous harvesting effort may be the major variable in annual volume levels. Some species, such as mosses, are believed to regenerate slowly after harvesting, while other species such as salal seem less vulnerable to harvesting pressure. Harvesting which takes small branches, leaves, cones, etc. is likely to be less risky than harvesting which takes whole plants or large sections of the plant.	Unknown/variable Unknown – unlikely that berry picking has a major effect. Harvesting of roots or rhizomes would have potentially greater impact.	Depends on species	Depends on species	Depends on species. Large volume wildcraft species generally spatially abundant.
Level of resource exploitation What is the harvest history? What are the results of inventory assessments? Stock or flow harvest?	Available data indicates that increases in harvest rates began in late 1980s as Japanese demand and local value increased. Shipments to Europe also increased during this period.	Floral greens have been harvested for many decades. Harvest has likely increased substantially since the mid-1980's and increases during economic downturns. . no inventory assessments available	First Nations have been harvesting wild berries and other foods for many thousands of years- berry harvesting is still important in some areas for subsistence, cultural and commercial purposes. Berry picking is a popular source of food and recreational use in rural areas by all groups. Wild vegetables used less by Indigenous peoples, but still of some significance – interest in urban markets appears to be increasing, e.g., wild vegetables, such as "sea aspagarus and fiddleheads." No harvest data available but research underway to identify locational attributes of huckleberries.	Unknown. Plants are collected for personal landscaping, for commercial sale to nurseries and for restoration projects. No known inventory or stock assessment in B.C. except as part of North Island Demonstration project and work under MoF in Robson Valley.	Unknown. No inventory studies or stock assessment undertaken (except as for landscaping plants).	Information available, but not systematic, in ethnobotanical and traditional use studies (See Turner and others). Also as for craft products.

1. Biological, physical and technical characteristics – cont.

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Status of habitat Has there been loss of habitat? If so, how much? What is the cause of habitat loss? Is loss or degradation stable, improving, or worsening?	Temporary loss of habitat. Timber harvesting precludes mycorrhizal fruiting for extended periods of time, but other saprophytic and …. Are not affected by timber harvesting. Unknown, but data is available to examine availability of habitat types.	Extent unknown – associated with timber harvesting and urban growth.	Unknown	Unknown	Unknown.	Unknown. Cascara and yew raised concerns in past but demand has decreased.
Harvesting methods What harvesting methods are used?	Generally fruiting body taken with no effect on mycelium, either cut or pulled from ground. Damaging harvest methods (for pine mushrooms) involve raking of top layer of soil and moss to uncover mushroom body below surface.	Varies. Generally, the branches are taken. In some cases, whole plants (mosses, lichens) are removed.	Depends on the species. Mainly hand picking for berries (some "raking" used; some evidence that whole plants pulled up or cut and berries removed at another location); roots and rhizomes are dug; fiddleheads snapped off or cut; other greens cut at base or snapped.	Whole plants removed.	Ranges from collection (partial plant) to whole plant removal.	Varies depending on species, amount of product required, market conditions.
Impact of harvesting methods Does the harvesting method damage the target resource? Does the harvesting method damage other species or habitat?	Potential poor or inappropriate harvesting methods (for example raking) can cause damage. Detrimental impact on soil will affect mushroom and other species. Greater education in harvesting methods could limit damage, but high value of resource leads to exploitation by any means – lack of property rights to resource leads to low stewardship values.	Moss harvesting seems to damage the resource; reports indicate that excessive harvesting damages production of e.g. salal. Effect on other species unknown – if excessive, could affect food resources for wildlife (berries, forage)	Main potential for damage would be the digging of roots and rhizomes or damage to plants in the course of berry picking. Excessive harvesting could reduce foods available for other species.	As whole plants are removed, there is significant potential impact of harvesting. In Northwest US. States, permits for salvage specify the number of individual transplants that may be taken, to avoid overharvesting in any particular area. Other species/habitat may be damaged in the process of harvesting target species.	Unknown	Unknown

1. Biological, physical and technical characteristics – cont.

Characteristic **Key Question**	**Edible wild mushrooms**	**Floral greenery products**	**Wild berries, fruit, herb and vegetable products**	**Landscaping transplants**	**Craft products**	**Medicinal and pharmaceutical products**
Effects of habitat enhancement or restoration.	Understory burning can significantly increase Morel volumes. This is a indirect benefit from stand maintenance. In Japan, Japanese Matsutake (Tricholoma Matsutake) volumes enhanced by stand management such as thinning. Similar efforts may be possible here.					
Institutional boundaries Are institutional boundaries currently defined for management of this resource? How are they defined and by whom? Are natural boundaries congruent with relevant political or administrative boundaries?	Resource availability based on biological growth patterns, not administrative boundaries. Some areas are informally defined, based on fruiting area by Forest Service districts. No or little management of resource occurs. Fruiting boundaries cross administrative boundaries; and public private boundaries.	No, except where private landowners issue permits for harvesting within the landowner's boundaries, or in the case of cedar boughs and other foliage that are regulated under the Forest Act. In this case, Forest Districts may authorize harvesting within designated harvest areas. No relationship between natural and administrative boundaries.	No	No	No	Most wildcrafting done in Kootenay and Okanagan region of BC.
Proximity to population centres Is the resource close to major population centres? Is the resource remote or isolated?	Resource is located in variety of areas both close to population centres and in more remote or isolated areas.	Highly variable.	Variable. Some berry species (especially introduced blackberry species) thrive in disturbed areas, so may be common near urban areas. Others less so, or would not be edible if harvested near urban areas due to pollution (e.g. greens/roots)	Products located over a large range.	Products located over large range. Crafts produced reflect what species are available locally.	

1. Biological, physical and technical characteristics – cont.

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Resource sensitivity/complexity Is the resource vulnerable to damage from other uses? If so, what are the competing uses and how sensitive is the resource to them?	Yes. Resource immediately affected by timber harvesting, but variable lower age class created by harvesting also promotes resource abundance in the longer term.	Yes Resource immediately affected by timber harvesting, but many species become more abundant as a result of harvesting (e.g. berry species, salal) that do not grow well (or at all) under heavy forest canopies.	Yes Same as for floral greens. Root species and other interior plants may also be damaged by grazing.	Yes. Timber harvesting, road construction, real estate development. Many species grow in a wide variety of habitats.	Yes. Timber harvesting. Wide array of products and forest conditions indicate that products generally plentiful.	Yes. Timber harvesting, other industrial activity.

2. Economic and market characteristics

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Personal use, small cottage or industrial resource. Is the resource industry artisanal (small scale cottage) or industrial in magnitude?	Industrial at buyer and distributor level, but small scale at harvester level. Harvesting done by large number of non-company workers, sell to buyers who are generally set up by larger scale distributor.	Largely industrial, although mainly harvested on a self-employed "piece work" basis. Relatively small number of buyers/ processors, but less concentrated than in the mushroom industry. Processors generally employ full-time staff. As capital costs are low, many small buyers likely move in and out of the industry, especially for seasonal products such as boughs, Christmas wreathes. No overall industry organization, or association.	Largely artisinal. No large buyers known for berries or other wild foods. Often pickers harvest for personal and commercial use and process surplus harvest into jams, pickles, etc. for both home use and sale. Some commercial jam producers use wild berries – this is much more highly developed In the United States where there is a sizeable wild huckleberry industry (jams, pies, chocolates, etc.) Some U.S. and Canadian companies have an extended line of wild food products, but not in British Columbia.	Quantities harvested unknown, but sales occur through nurseries for use in residential and commercial landscaping, movie sets and other personal small scale use of native plants.	Small scale cottage related to craft fairs and small group associations. Larger scale industrial supply for higher value products, such as cones and other dried floral , mosses and miscellaneous products.	Personal and commercial.

2. Economic and market characteristics – cont.

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Economic foundation Are property rights clearly defined? Do PR reflect open access, common of private property? Is resource subtractable and excludable?	94% of land base state owned. Remainder in communities or held privately. Harvest of EWM reflects open access on public land and to a lesser extent on private land, although theft still occurs. One harvesters use precludes someone else's thus resources are subtractable, difficult to enforce exclusion.	As for mushrooms. Except for species (e.g. boughs) regulated under the Forest Act. ** review Section 58 Open access except on private lands and where product regulated, and then largely a geographically limited "open access" situation. Subtractable; exclusion difficult	As for mushrooms.	Crown is dominant land owner; some private land. Open access on public land.	Crown is dominant land owner; is some private land. Open access.	Crown is dominant land owner; is some private land. Open access.
Resource revenues Does owner receive harvest revenue? At what level are rents captured? What are potential revenues?	No revenue collected on State held lands. Minor revenue collected on some private land. Current revenues collected not know. Revenue potential on State lands at 10% of value could range from $10-20 mill.	No rents collected by the State; permit or access fees on some private lands (e.g. Timberwest and Weyerhaeuser). Fees collected for boughs. Current revenues collected not known. Based on estimated values of salal ($55-60 million) and ferns ($2-5 million) ($ paid to harvesters); rents set at 10% would range from $5.7 to $6.5 million. With other products (boughs, etc.), revenues might approach $7-8 million.	As for mushrooms No.B.C. information – check US stats if any..	Unknown -	No. Uncertain, likely producer.	No. Uncertain, likely producer. If personal use, by user.
Subsistence or market oriented. Is the resource marketed, or used for subsistence use? What proportion of the harvest is sold/consumed?	Greatest number of species harvested for personal use, but four species represent the largest volumes harvested for commercial use. Proportion sold/ consumed unknown.	Commercial use, except for minor recreational harvesting. Majority sold – large export market for floral greens; majority of salal exported to Europe.	Significant First Nations use (personal, cultural, commercial). Majority of product consumed locally or in B.C. market.	Personal and commercial use.	Personal and industrial use. .	Subsistence and market oriented. Comprises important source of traditional medicines for First Nations.

2. Economic and market characteristics – cont.

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Market structure Is the market multi-level? Are there many buyers/distributors? Are there many sellers? What are the power relations between buyers and sellers?	Market consists of harvesters, buyer agents, buyer-distributors, retailers. Number of buyers/ distributors uncertain, estimate of 10-20. Sellers are harvesters and can number in the thousands. Buyers hold power over disorganised labour/price set in Europe/Japan. Many buying sheds at any one location controlled by buyer-distributor level.	Uncertain. 22 companies have been identified as marketing to Europe and North America. Many sellers – both local part-time harvesters and transient, full-time harvesters. Buyers dominate market; relationships among international companies unknown. Anecdotal evidence suggests close relationships among dominant floral green companies.	Unknown. Many sellers, but much less well-developed Markets than greens and mushrooms. Farmers' markets, craft fairs, etc. a major outlet where the harvester is also the buyer/seller.	Main buyers believed to be forest companies, Department of Fisheries, Ministry of Highways, contractors and others for restoration; local governments for parks/public lands; schools; park agencies; nurseries, and architectural firms.	Unknown.	15-20 large commercial wildcrafters. Product sold to bulk suppliers and manufacturers.
Market orientation Is the resource sold in local, domestic or international markets?	Resource sold mainly to Europe and Japan, but domestic market showing signs of interest, notably U.S. and Western Canada in major centres such as Vancouver and Victoria.	Europe, United States, Canada, Japan	Presumed mainly local/domestic. Could be some international markets for specialty jams, green vegetables to Asian markets (e.g. bracken fiddleheads)	Unknown – suspect primarily local/domestic	Unknown. Large American retailers such as "Michaels" known to stock many wild craft species (bark, conks, twigs, etc.)	Wholesale to large regional or national companies; product retailed in all regions.
Market uncertainty What is the level of market uncertainty? Does market uncertainty affect demand?	Market generally based on long-term relationships providing some certainty. Demand depends on domestic supplies (consuming countries) and new sources which creates uncertainty for higher cost suppliers.	Long-term relationships, strong linkages with mainstream floral industry.	Ability to market effectively and obtain sufficient return on small volumes generally associated with high per unit costs of production.	Unknown	Unknown	Unknown

2. Economic and market characteristics – cont.

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Resource value What is the economic value of the resource. What is the market price per kilo/pound? What is the price paid to pickers? Are prices rising, stable, falling? Can volumes and values be predicted based on previous volumes and values? Level of risk?	Total declared value of exports of mushroom fresh or chilled (Stats Can) in 2000 was Cdn. $50.8 million; average 1996-00 value $38.5 million. Prices paid vary per product per year. In 2000, declared export values ranged from $22.38 to $39.31 for shipments to Europe and Japan respectively. Varies widely by product and by day/week. Prices paid to pickers are for Chanterelles $1.50/lb, Pine mushrooms $15/pound? Prices for Chanterelles fell about 75% after 1999 harvest, although declared prices were stable. Prices for Pines mushrooms can be extremely unstable during harvest season; over time average price somewhat constant. Average annual prices generally predictable. Volumes demanded or supplied cannot be predicted based on previous year. Productivity estimates are possible with sufficient research and data.	Unknown Varies by product. Most information available is from U.S. sources. Sample prices between 1989 and 1996 are as follows: Western red cedar boughs, per ton (U.S. $) 1989 $460 1995 295 1996 433 Salal (bunches – U.S. $) 1989 $ 0.90 1995 $ 0.95 1996 $1.06 Evergreen huckleberry (bunches – U.S $) 1989 - $0.65 1995 - $0.68 1996 $0.73 In general, prices for floral greens seem less variable (salal in B.C. has been about $1.30-$1.60 CDN per bunch) for some years. Prices may vary by demand and seasonal supply, more than by year. With adequate inventory data, volumes could likely be predicted quite well. Values seem more stable than some other NTFPs. Risk for buyers and sellers less than for other products, however, florals tend to be Somewhat "faddish" – opportunities for new products, but not guaranteed long term markets. Pickers tend to stay with "staples" such as salal and False box. Anecdotal evidence suggests that shippers' margins on the major floral greens are quite low.	Unknown Varies by product. Some U.S. prices (1996) for berries are: Red huckleberries - $2.20/lb. Blackberries - $1.67/lb. Blackberries seen for sale in coastal B.C. at $2.00 lb. (2001). Prices seem to be comparatively stable. Higher than similar domestic products, but varies depending on species. Predictability of volumes/values unknown. Various risk for buyers and sellers – highly perishable products – lack of market infrastructure, e.g. buyers with refrigeration in the field increases potential losses in handling and processing.	Varies by species. Not currently available.	Unknown. Products are either used as components of value added goods for personal use or commercial resale.	Unknown.

2. Economic and market characteristics – cont.

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Resource investment Does industry invest in the resource? - infrastructure investment - land base investment	No industry investment to maintain or enhance the resource stock, but investment in resource flow (harvested volume) reflected in plant and shipping facilities.	None known.	No, although there has been interest/effort by First Nations to revive burning as a way of increasing wild berry productivity	Unlikely, but not known. Native plant nurseries propagate wild plants (see above – 44 species commonly available in BC)	Unlikely, but not known.	Unlikely, but not known.

3. Harvester and community attributes

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Number of harvester groups How many harvester groups are there (including commercial, personal and traditional)?	All groups, commercial, personal use, and traditional represented.	Mainly commercial – some recreational	All groups represented – probably larger subsistence, traditional and recreational than most other types of NTFPs	Unknown	Unknown	Commercial: unknown, supply to 15-20 . Traditional/subsistence: hundreds.
Heterogeneity among groups What are the main differences among user groups (ethnic, wealth, gear type, residency, preferences re: resource use, attitudes towards risk and the future?	User groups overlap, but each group has high level of intra- and inter heterogeneity. Traditional users are First Nations, some of whom also harvest for personal and commercial reasons. Most commercial harvesters are not First Nations. Commercial and subsistence groups comprised of range of cultures, income levels, and residency.	Most commercial users either "full time" – generally Asian-Canadians, but also Caucasians remain involved. Also includes local part-time harvesters. Few First Nations harvesters. Note – very little is known (almost no research conducted) on harvesters of floral greens in British Columbia.	User groups overlap. Considerable concern among some First Nations groups about incursion of "outsiders" into traditional berry harvesting areas. Probably more First Nations commercial harvest in this than for other NTFPs. Middle/upper income interests largely recreational. Traditional small scale uses for farm markets etc. by individuals with other occupations or status (farming, forestry, homemakers, children, elderly)	Likely mainly Caucasian but no data to substantiate this claim.	Likely mainly Caucasian but no data to substantiate this claim.	Commercial and personal/traditional users likely differ. Many First Nations harvest for personal use. Uncertain about commercial harvesters. No data available.

3. Harvester and community attributes

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Size and composition of harvester group What is the size of harvester group? Is there more than one "sub-group" within the user group?	Commercial group is the largest. First Nations sub-set of subsistence thus subsistence group larger than traditional group. Numerous sub-groups within commercial (local to circuit harvesters) and subsistence user groups. Traditional use of mushrooms not high in many areas.	Commercial group dominates. Sub-groups defined by ethnic background and whether local, part-time or transient "full time".	Unknown. Sizeable First Nations and European rural populations harvest wild berries.	Unknown	Unknown.	Unknown
Heterogeneity within harvester group What are the main differences among members of the user group?	Members within commercial group are transient and local, comprised of Caucasian, Asian, Hispanic and First Nations, and include immigrants and non-immigrants. Proportion or participation of illegal labour uncertain. Subsistence and traditional groups also vary widely.	Similar to mushroom harvesting – may be fewer transient harvesters as resource is less variable, but transient harvesting may be increasing from the United States.	Ethnic background. Commercial versus recreational use.	Unknown	Unknown.	Unknown
Dependence on the resource How important is the resource as a source of income to harvester?	Varies, proportion uncertain. Commercial group includes local supplemental income earners and circuit pickers. Traditional and subsistence groups use as supplement to diet, but proportion uncertain.	For some harvesters may be highly significant. For others, floral greens are part of a seasonal round of part-time, generally resource-based, activities providing supplemental income. Length of season may be longer than mushrooms so would attract more local harvesters.	Varies, probably fairly minor, but may be important source of cash income for groups with otherwise subsistence incomes. Significant contribution to food resources in some communities. In some parts of the U.S. (e.g. Idaho, Washington) berry picking more established as part-time/seasonal income.	Unknown	Unknown.	Unknown

3. Harvester and community attributes – cont.

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Residence Do all users live in the vicinity of the resource? Is there more than one geographic community of users? Are users geographically mobile?	Users both local and non-local. Users from Canada, US, and outside North America. Many users on mushroom circuit from Canada to the US.	Both local and non-local. Transient pickers mobile, but probably less so than mushroom pickers.	Probably mainly local – not highly mobile (berries are not high commercial value - many species – geographically dispersed, so little reason to travel great distances) Some prized species (soapberries) have been traded over considerable distances by First Nations groups.	Unknown, but likely local.	Unknown, but likely local.	Unknown, but likely local.
Occupational mobility Is it easy or difficult for users to find other employment?	Proportions uncertain. Some not comfortable with mainstream economy, others employed in variety of other jobs and careers.	Some pick for lifestyle reasons; for many, other jobs are not easily available, due to language or skill limitations.	Unknown. Berry picking not normally a major source of income in B.C. .	Unknown	Unknown	Unknown. Likely similar to mushroom pickers. Uses harvest to supplement income and considers picking an enjoyable way of life.
Income What is the annual income of harvesters?	Many harvesters use mushroom income as supplementary. Professional circuit pickers do not provide data on seasonal harvest or yearly harvest activity. There is a wide variation in income levels at any one location, and for product.	Unknown. A good picker in a good area is said to be able to earn Cdn$500 per week.		Unknown	Unknown	Unknown

3. Harvester and community attributes – cont.

Characteristic **Key Question**	**Edible wild mushrooms**	**Floral greenery products**	**Wild berries, fruit, herb and vegetable products**	**Landscaping transplants**	**Craft products**	**Medicinal and pharmaceutical products**
Information and knowledge on the resource and about its management Is there a good information base about this resource? What sources of knowledge (scientific, local, indigenous) are used in the management of the resource?	Level of biological and economic information is improving, but making productivity and trade-of analyses remains difficult. Some informal management occurs within traditional uses. Resource owner does not formally manage resource. Harvesters have broad practical knowledge about specie attributes and conditions of sustainability. Not generally acknowledged in decision making or management.	As for mushrooms. No formal management. Some management of boughs where permitted by forest districts; some management where boughs used for oil extraction, but mainly to avoid conflict with timber harvesting. Harvesters have broad practical knowledge about specie attributes and conditions of sustainability. Not generally acknowledged in decision making or management.	Ongoing research providing necessary data for appropriate management. Harvesters have broad practical knowledge about specie attributes and conditions of sustainability. Not generally acknowledged in decision making or management.	Harvesters have broad practical knowledge about specie attributes and conditions of sustainability. Not generally acknowledged in decision making or management.	Harvesters have broad practical knowledge about specie attributes and conditions of sustainability. Not generally acknowledged in decision making or management.	Harvesters have broad practical knowledge about specie attributes and conditions of sustainability. Not generally acknowledged in decision making or management.
Leadership What are the main sources of leadership within the user group? How are decisions made within the user group?	Commercial harvester groups vary widely. Leadership comes through buying sheds, household or group heads. Harvesters attracted to industry due to its lack of formal leadership structure. No cohesive association or membership organization to provide decision making structure, although informal networks among harvesters and word of mouth act as means of disseminating information and providing platform for collective action. Examples not known.	Unknown.	Unknown. May be organizational arrangements within e.g. First Nations communities. Unknown – may be recognized family picking areas within First Nations communities that are recognized.	Several groups in B.C. interested in wild plants, e.g. Native Plant Society, Native Plant Committee of the BCLNA – relation to wildcrafters unknown.	Unknown	Unknown. Harvesters work buyers who have connections with purchasers. Decision making or price setting process unknown, but likely at the purchaser/bulk supplier level.

4. Institutional structure

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Existence of institutional or other norms Formal regulations, government Informal ad hoc or de facto, industry Knowledge of transactions costs (i.e., cost of establishing and enforcing rules and regulations). Benefits of institutional norms	None. Understood practices between parties, even if no cooperation. May be implicitly known by industry to point of current industry organization; cost of formal rules unknown. Highly dependent on type of norms established.	None except for Section 58, Forest Act (check) and where forest companies may regulate harvesting areas (may be informal norms of allocating areas to certain harvesters to avoid conflict with each other or with other forest users, e.g. shake block cutters) Unknown if any informal arrangements exist re. picking areas, etc. Would respond to concerns such as trespass, overharvesting, garbage, fire	None Likely informal arrangement in some (First Nations) about "private" picking areas. As for floral greens – also considerable potential (and actual) conflict between First Nations and "outside" berry harvesting. Norms could help regulate/reduce conflict.	No formal regulations in place.	No formal regulations in place.	No formal regulations in place.
Organization of resource management Which agencies have management responsibilities for the resource? What are the main legislative, regulatory, policy or other sources of legal authority that govern use of the resource?	Ministry of Forests. *Ministry of Forests Act, Forest Act, Forest Practices Code of BC Act*, Section 104, 107, 108, 216 (legis. not as yet enacted in regulation). Community Forest Tenures include rights to NTFP.	Ministry of Forests. Same as mushrooms	Ministry of Forests. Same as mushrooms	Ministry of Forests. Same as mushrooms	Ministry of Forests. Same as mushrooms	Ministry of Forests. Same as mushrooms

4. Institutional structure

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Characteristics of community or user organization. What are the characteristics of the community or user organization? - legal status, - membership, - human, financial and other resources, - mandate/objectives, - date organization formed, - date organization become involved in resource	No formal user organizations, at either the harvester or buyer level. Informal arrangements may exist among buyers, but this is uncertain.	No formal organization. May be informal conventions that groups of pickers sell to buyers, or among buyers, but this is not known.	Some small-scale commercial ventures have organized primarily First Nations pickers into, e.g. co-ops (Wilp Sa May) and on the West Coast (Isaak – check details re. NTC/Ahousat berry picking) Other arrangements unknown.	Unknown	Unknown.	Unknown.
Institutional history Do members of the user organization have a history of successful collective action? Do management agencies and the user organization have a history of successful collective action?	Uncertain if any collective action has taken place. No formal collective action has occurred between user group and land management agency.	Unknown. Same as mushrooms.	Unknown. Same as mushrooms.	Unknown. Same as mushrooms.	Unknown. Same as mushrooms.	Unknown. Same as mushrooms.
Rights of access and withdrawal Who has the rights of access to, and withdrawal from the resource? What do the rights of access and withdrawal entail (e.g., individual quotas, leases, licences etc.)? Who makes rules regarding how rights of access and withdrawal shall be exercised	Removal of any resource from Crown or private land without authority is theft. Are no formal provisioning of property rights, leases, permits, etc. Provincial government has jurisdiction over Crown lands, but has not acted in this capacity. Are rights of access excersized by private forest landowners. Nisga'a has initiated permit system for its lands located in the Nass Valley.	Removal of any resource from Crown or private land without authority is theft.	Removal of any resource from Crown or private land without authority is theft.	Removal of any resource from Crown or private land without authority is theft. No formal provision of rights.	Removal of any resource from Crown or private land without authority is theft. No formal provision of rights.	Removal of any resource from Crown or private land without authority is theft. No formal provision of rights. First Nations claim the right to many medicinal products, but do not have jurisdiction outside reserve areas.

4. Institutional structure – cont.

Characteristic Key Question	Edible wild mushrooms	Floral greenery products	Wild berries, fruit, herb and vegetable products	Landscaping transplants	Craft products	Medicinal and pharmaceutical products
Management rights (collective level rule) Who specifies and allocates rights of withdrawal? Who specifies and allocates rights and responsibilities about other management activities (e.g., research, development, enhancement)? Who carries out management responsibilities (list by agency)?	Provincial government has jurisdiction on Crown land, private land owners on their private land. Responsibility lies with provincial government. Provincial Ministry of Forests has legislated mandate to manage forest resources.	As for mushrooms, except for boughs	As for mushrooms	Rights not specified or issued at this time	Rights not specified or issued at this time.	Rights not specified or issued at this time.
Right of exclusion (collective level rule) Who determines the rights of access and rules about how rights of access may be transferred? Can rights be transferred and how?	On Crown land provincial government has jurisdiction. Private landowners determine rights on their land. No formal property rights provided.	As for mushrooms	As for mushrooms	As for mushrooms	As for mushrooms.	As for mushrooms.
Right of alienation Who determines whether and how the rights of management and of exclusion can be alienated?	Provincial government. No rights of alienation as no property rights to NTFPs defined.	As for mushrooms.	As for mushrooms.	As for mushrooms.	As for mushrooms..	As for mushrooms..
Impetus for institutional change Where did the main source of pressure for change originate?	Impetus rests mainly with resource agency, but also through academic interest and research, forest companies related to certification, and First Nations related to land claims issues. Appears to be little incentive for change within industry, which currently enjoys wide range of freedoms in resource use.	As for mushrooms. Interest from forest companies (which are concerned to varying degrees with trespass, fire, environmental hazards); resource managers and researchers and an unknown (probably small) proportion of the floral greens industry who see advantages from e.g. the ability to secure long-term tenures for products.	As with other categories. Concern from First Nations regarding damage and overharvesting of traditional sources of food.	Concerns from environmental and native plant groups about extraction of plants from the wild. Ethical issues for nurseries in buying wildcrafted plants.	Likely no impetus for change within industry, but change may be desired from community and First Nations perspective.	As with other categories. Likely no impetus for change within industry, but change may be desired from community and First Nations perspective.

4. Institutional structure – cont.

Characteristic **Key Question**	**Edible wild mushrooms**	**Floral greenery products**	**Wild berries, fruit, herb and vegetable products**	**Landscaping transplants**	**Craft products**	**Medicinal and pharmaceutical products**
Monitoring and enforcement Which agencies have monitoring and/or enforcement responsibilities and what are they? Are responsibilities carried out?	Monitoring responsibilities currently lie with Ministry of Forests. No enforcement responsibilities carried out specifically related to NTFP harvest activity on Crown land. Monitoring in some areas carried out through research programs or through general interest of district forester. Monitoring for riparian and wildlife impacts undertaken on broader scale that will identify impacts related to unregulated harvest of NTFPs.	As for mushrooms.	As for mushrooms.	As for mushrooms.	As for mushrooms.	As for mushrooms..
Conflict resolution How are conflicts adjudicated?	No formal conflict adjudication process in place. Current conflicts generally result when timber development impacts prime mushroom area, when mushroom harvesters use inappropriate methods, or between local and non-local groups. In most areas there is no mechanism to manage for both timber and mushrooms.	None known to exist	None known to exist	No formal arrangements	No formal arrangements.	No formal arrangements.

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